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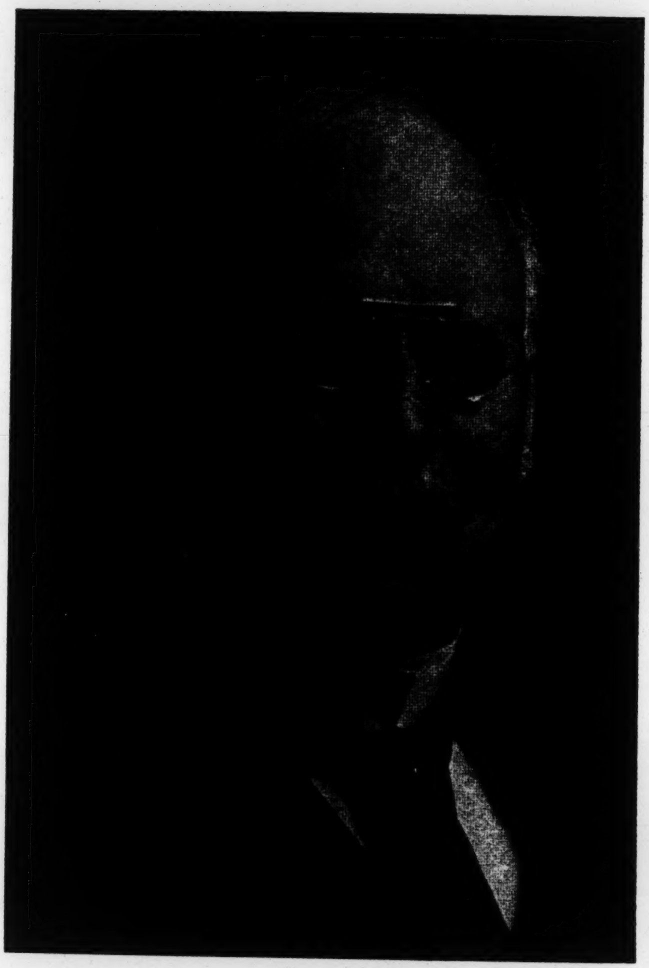

PROF. JOHANNES ILBERG
[1860-1930]

[From Galen: De Simplicium. Venice, 1625.]

ANNALS OF MEDICAL HISTORY

New Series, Volume VI January, 1934 Number 1

GALEN'S WRITINGS AND INFLUENCES INSPIRING THEM

By JOSEPH WALSH, M.D.

PHILADELPHIA

Part 1

Recapitulation of his writings. Birth and birthplace. Shrine of Aesculapius at Pergamum. Wiegand's excavations. Reasons for great piety. Early philosophical studies. How he came to enter medicine. His teachers. Examination of patients and diseases differentiated. ritings as a student. His Father and Mother. heritance of culture, irascibility and the irit of investigation. His financial circumances. Medical textbooks. Daily activities. oes to Smyrna for further instruction.

TAKING up the pen at the age of thirteen (xix,43)[1] Galen, the most voluminous of ancient medical writers, scarcely ever put it down except for two periods till the age of sixty-eight. Between thirty-five and thirty-nine travels and the great pest interfered, and between forty-nine and sixty-three the misrule of his protege, the arena-loving Emperor Commodus.

Extant are writings on every subject in medicine aggregating over two and a half million words,[2] and from his description of others, we have reason to believe about half as many more have been lost. In spite of all that we possess, and all that have experienced the natural dispersion and disintegration of the seventeen intervening centuries, we are able through the researches of Johannes Ilberg[3] to place the great majority in their consecutive order, and knowing the history of the period determine influences inspiring them.

These writings promulgate discoveries in anatomy and physiology never surpassed by one man. They display an acquaintanceship with the work of every prominent physician back to Hippocrates to such an extent that it is considerably from his quotations our knowledge of ancient medicine is derived. They display an acquaintanceship with the development of philosophy equal to that of medicine. They manifest a logic not always sound, but making most of his explanations plausible. They are pervaded by a remarkable piety and an almost unbelievable credulity considering his broad education and extensive travels. They disclose a self reliance increased by opposition and an irascibility frequently exceeding the bounds of moderation. Finally they reveal the influences leading to the development of these traits and capabilities which should be known in order to appreciate them.

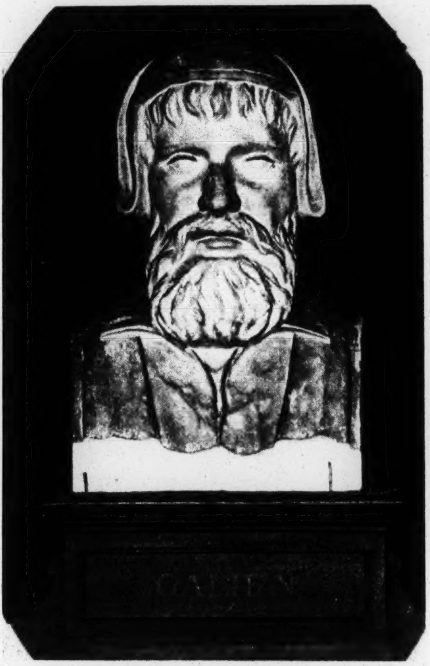

Fig. 1. Bust of Galen in the Medical Library of the University of Paris.

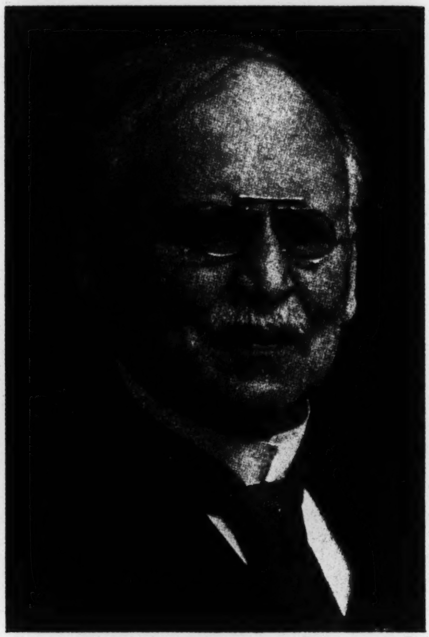

Fig. 2. Oberstudiendirecktor, Professor Dr. Johannes Ilberg, to Whose Research the World Is Indebted for Most of Its Accurate Chronology of Galen's Life. He Was Born July 10, 1860 at Magdeburg and Died August 20, 1930 at Leipsic. He Was a Doctor of Philosophy, an Honorary Doctor of Medicine, and a Member of the Saxony Academy of Science. The Photograph Comes from the Society of Early Scholars of the Queen Carola Gymnasium in Leipsic through the Courtesy of Professor Haberling and Dr. Temkin.

Born September 130 A.D.[4] into an opulent, well-known and highly respected (XIV, 623; XIX, 40) family[5] in the City of Pergamum[6] on the classical coast of Asia Minor, which gave to the world philosophers, physicians and literary men[7] without number, no expense was spared on his education. The principal industry in this conservative old city was the miracle-working shrine of Aesculapius to which flocked the sick and the crippled from all parts of the empire with gold for its prebendaries. The well-known commercial industries were the manufacture of ointments, pottery, morocco, parchment and writing ink. And it is interesting to note as Galen stands out for his piety which developed from devotion to the shrine, his profane activities employed all of his native city's commercial products, since the ointments had to do with medicine, the pottery with ointment jars and inkwells, the parchment with writing, and the morocco with bookbinding.

Shrines of Aesculapius were everywhere,[8] but that of Pergamum outdistanced all in beauty and in the number of its miracles. In fact Galen assures us (xiii, 272), and an expression of Marcus Aurelius confirms,[9] that the god of medicine had come to be thought of in connection with Pergamum as Diana with Ephesus and Apollo with Delphi. So magnificent were the buildings that in Byzantine times this shrine was considered one of the wonders of the world.[10]

It was located just outside the city in connection with an inexhaustible sacred spring with a covered passageway three thousand feet long leading thereto. From the renowned archeologist Theodor Wiegand[11] we have such an elaborate and detailed account due to painstaking excavations over the years 1928 to 1932 that we are practically able to picture it again. We see the impressive monumental entrance, the Pantheon-like Temple of Aesculapius, the treatment and incubation house, the theater and the magnificent colonnades.

Without difficulty we follow the patient from his appearance in the forecourt to the end of his stay. We see him carried on his litter or walking with halt and trembling steps to affirm his allegiance to the great empire in the exquisite Temple of Hadrian, cleansed by the waters of the sacred spring, approach with awe the sanctuary of the healing god, and retire in anxiety after edifying evening devotions in the incubation house while hoping for recognition and help. We observe the routine of treatment by diet and drugs, by baths and exercise varied by soul-stirring processions of priests and attendants with music of flute and cithara, the singing of hymns and paeans, the burning of incense, and solemn prayers and sacrifices.

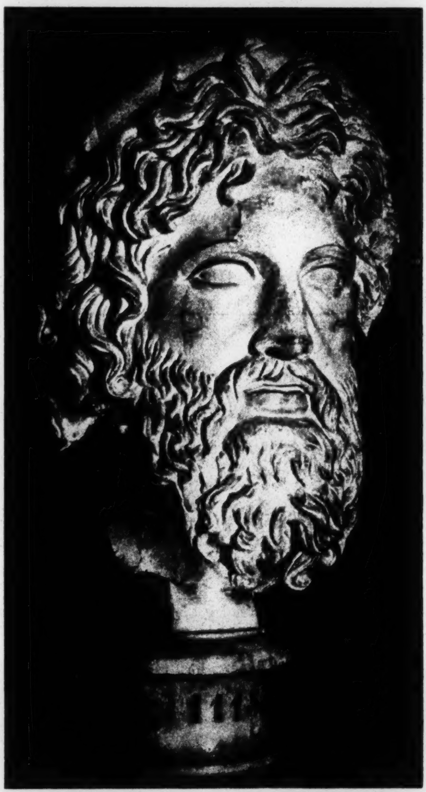

Fig. 3. Head of Aesculapius at Present in the Museum at Naples, a Copy of That in the Temple at Pergamum. It Represents Galen's Mental Conception of the God of Healing.

On presenting himself the patient, who as a rule had been to physicians without relief, was admitted only if not suffering from an incurable malady like far-advanced cancer or a serious acute disease with a probability of death. In these cases he got no farther than a detention house or hotel outside the walls. When found suitable he was made comfortable in a bed in the incubation house and remained till rejected by the god or was vouchsafed a dream or other evidence that the god was active in his behalf.[12]

The priests and attendants did their utmost to put him in a receptive mood to hear from the god either directly or through the medium of a dream. This dream was interpreted in a therapeutic way, and the remedies or regime instituted.[13] The priests were commonly men of culture and education standing high in the civil and social life of the city. They were advocates of simplicity, temperance and high ideals. Some of their public prayers for aid and enlightenment have come down to us and they are models of diction and piety.

Among the eminent of the period whom we know, even the highly educated, almost all were firm believers except the satirist Lucian and the philosopher Demonax. In fact we find visiting the shrine emperors,

---

FIG. 4. THE SHRINE PLAN.

1. Monumental entrance with its Forecourt, the gift of Claudius Charax, a Pergamenian priest, philosopher and historian during Galen's boyhood. It consisted of an impressive open court (104 × 104 feet) paved with white marble surrounded by a Corinthian colonnade with a striking propylon, or columned gateway, opening from it into the large central square of the shrine. It was reached from Pergamum by a covered passageway (about 3000 feet long) extending from the municipal theater to the northeast corner.

2. Temple of Aesculapius, somewhat after the pattern of the Pantheon in Rome, newly erected during Galen's boyhood by the celebrated architect Rufinus, though the shrine was already 500 years old. It was built of trachyte, a beautiful porphyry-like stone and was 93 feet in diameter. The dome was richly decorated with mosaic, the sides with varicolored marble and glass. The floor was of blue-violet and yellow-veined Phrygean marble. At the corners of niches stood decorative columns with Corinthian capitals. The large niche at the back contained a statue of Aesculapius (see Fig. 3) and was lined with a delicate mosaic and imitation jewels.

3. Large irregularly circular building with six projecting apses probably the sleeping (incubation) and treatment house for patients. It consisted of a huge basement 188 feet in diameter and an upper apsed story 135 feet. The principal entrance, an arched doorway, was from the southeast corner of the large square.

4, 5, 6. Magnificent colonnade encircling three sides of the precinct making a covered walk 27 feet wide and 1137 feet long. The columns were Ionic monoliths, the walk was of marble, the back-walls of richly colored marbles and opus sectile; the whole very impressive in its beauty. It was used for pleasure, exercise and religious processions. The large square included by this colonnade covered 7½ acres. Its pavement was also of white marble.

7. Theater, a gem of classical Grecian architecture for religious ceremonies and pageants.

8. Artistic temple (52 × 60 feet) dedicated to the worship of the Emperor Hadrian during whose reign Galen was born, containing in a niche at the back a heroic naked statue of this ruler. The floor was of richly colored opus sectile and the entire building a masterpiece of Pergamenian art.

9. Altar to Artemis, twin-sister of Apollo, the Father of Aesculapius. She was worshipped as the goddess of chastity, both girls and boys being put under her protection. From one of her names λύη (purifier) comes the Latin word lues meaning a plague. She was also sometimes recognized as Hygeia, healer of the sick and as Eilithyia, the goddess of childbirth. The latter was the midwife when the baby Aesculapius was born. Artemis' temple at Ephesus, 85 miles to the south, where she was depicted with numerous breasts in the character of the universal mother, was one of the most celebrated in the world.

10. Sacred Spring at the root of a plane tree open to the sky. The water described as sweet and tasty flowed into a marble basin 11 feet in diameter located in a hollow six steps down, and overflowed into a conduit running beneath an underground passageway leading to the treatment house.

11. Small temple and other buildings in connection with the Spring.

12. An underground passageway or tunnel 8 feet wide, 9 feet high and 260 feet long with a stairway at each end extending diagonally from the so-called treatment house to the center of the large square near the Sacred Spring. There were air and light holes in the roof every 17 feet. Beneath its marble floor ran the overflow from the spring and the seepage of water through its walls.

The entire shrine conformed to the classical simplicity and taste of the Forum of Trajan and the little Temple of Faustina in Rome. On account of its covered walks, its theater and splendid water it was a popular gathering place for the cultured and the piously inclined.

Outside the precinct to the east, north and west in close proximity to the walls were houses of priests, physicians and attendants, as well as hotels and boarding houses for patients and their friends. Foundations of such houses are shown on the plan immediately behind the temple. The south wall overlooked a ravine with a running rivulet.

This illustration and explanation are from Theodor Wiegand: Zweiter Bericht über die Ausgrabungen in Pergamon 1928–32: Das Asklepieion.[11] We extend to him congratulations on his splendid work and grateful acknowledgment for permission to use it. Needless to say the original publication gives a much more extended description with many illustrations and reconstructions and is a monumental addition to archeology and the history of medicine.

philosophers, rhetoricians and medical men.

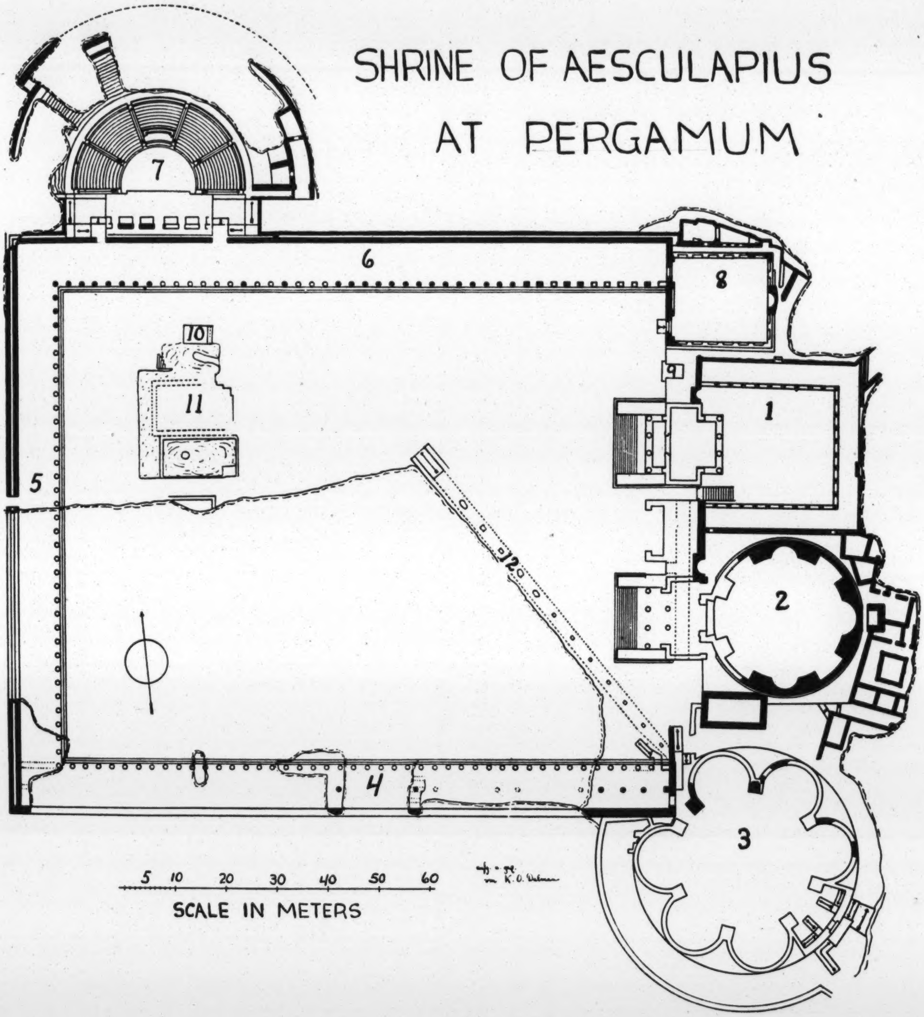

Fig. 4.

The Emperor Hadrian, during whose reign Galen was born, was so impressed that he built a temple on the grounds to the Imperial godhead. The pious Marcus Aurelius, while friendly with our physician, spent an incubation period within the precinct and thanks the god for remedies against his blood-spitting and dizziness,[14] though we have no reason to believe they accomplished results. The degenerate Emperor Caracalla, whose father Septimius Severus had been a patient of Galen, visited it fruitlessly hoping for the cure of a condition not spoken of openly, and hence probably a disease of the genitalia.[15] Nicomachus, the Neo-Pythagorean philosopher, came on account of obesity with good effect. According to Galen's naive observation (vi, 869) "Nicomachus was so fat he could not move, but Aesculapius cured him."

The brilliant Polemon, the most celebrated rhetorician of the age, appeared with a serious rheumatoid arthritis to which he later succumbed. His greatgrandson, the charming and fluent Sophist Hermocrates, was equally unfortunate, for in spite of his appeal to the god he died at the age of twenty-eight. The cause of death is unknown but fast living possibly entered into it, since inheriting a handsome property he had already squandered it on boon companions and strong drink.[16] He was probably one of the many Galen had in mind when he flayed (x, 3)[17] the voluptuaries in Rome. Hermocrates was the son-in-law of Galen's patient Antipater, the private secretary of the Emperor Severus (xiv, 218).

Polemon's pupil, the beloved Aristides, called the Demosthenes of his age, lived at the shrine weeks at a time on account of a muscular paralysis due to a psychopathic condition, or possibly a spinal sclerosis. It is amusing to read that one of the treatments prescribed in a dream, which we have reason to believe he followed, was an enema of Attic honey.[11] He was so impressed that he eventually became a priest of Aesculapius. He declares that by bathing in the sacred spring many recovered eyesight, or were cured of asthma and other chest complaints, lameness and loss of speech.[18] He was for a time a patient of Galen's medical teacher Satyrus.[19] The socially distinguished Sophist Antiochus frequently spent nights within the Aesculapian precinct at Aegae for the pleasure of conversing with the god who came to his bedside even while awake.[20]

To the majority of twentieth century readers much of this sounds puerile, but to even the greatest intellects of that time the personal interposition of the gods was as real as the most commonplace occurrences of life. There has probably never been a hundred years of greater credulity. Antoninus Pius, Marcus Aurelius, Pliny the Elder, Pliny the Younger, Suetonius, Plutarch, Epictetus, Arrian, Cassius Dio, Fronto, Martial, Rufus of Ephesus, Galen (ii, 29), in fact practically all stoics (and stoicism had almost conquered the intellectual world) were the most innocent and credulous believers in miraculous happenings. In addition, Hippocrates, Herophilus, the Empirics, and practically all philosophers believed in dreams.[21] In fact there was a very extensive literature on the interpretation of dreams which was recognized as a real science.

For instance, Artemidorus of Daldis, contemporaneous with Galen, devoted his whole life to the compilation of the known literature on dreams. Inspired by Apollo who appeared to him in visible form in a dream, he studied night and day and traveled over most of the civilized world. He described himself "of Daldis," though born in Ephesus, in order that his mother's obscure birthplace might have the glory of an illustrious name.[22]

In a little article (vi, 832–835) entitled "Diagnosis from Dreams," which deals with the subject from a medico-pathological and symptomatic standpoint, Galen gives us an idea of how the more intelligent of the priests probably went about the interpretation when the dream itself did not directly specify the treatment. In it he informs us:

> To dream indicates an abnormal condition of the body. To see a fire in sleep means this condition is due to yellow bile, to see smoke or fog or profound darkness, black bile, to see a violent rain means it is due to an overabundance of cold humidity, to see snow and ice, an overabundance of cold phlegm. . . .
>
> We conclude that the wrestler who dreams that he is standing in a cistern of blood which he barely overtops is affected with an overabundance of blood and requires blood-letting. The dream of drinking to excess occurs to the thirsty, of eating insatiably to the hungry and of sexual intercourse to those replete with semen. For the soul in sleep divorced from externals seems to sense the condition of the body and to conceive as present whatever it desires. . . . Capable as it is also of picturing what we are accustomed to do daily or think of doing, and of conjuring up sometimes even phenomena presaging future events a difficult diagnosis of a body condition may be indicated by dreams. And though this matter of presaging is not easy to explain, it has been proven by experience.

We shall find our physician himself influenced by dreams throughout life: at the age of sixteen by his father's dream that he take up the study of medicine (x, 609; xvi, 222); at the age of twenty-seven when ill with a subdiaphragmatic abscess by two evident dreams (xi, 314; xvi, 222) apparently in the incubation house of the shrine itself that he open an artery in the hand between the thumb and first finger and let it bleed till it stopped spontaneously; at the age of thirty-eight by the appearance of Aesculapius in a dream forbidding him to go to war with Marcus Aurelius (xix, 18); and about the age of forty-three by a dream commanding him to complete his treatise on the anatomy and physiology of the eye (iii, 812). Finally, he treated successfully numerous people by remedies revealed in dreams (xvi, 222), and saw others cured for instance, an attendant of the god in Pergamum (xi, 315), who suffering from pain in the side had been instructed somewhat like himself to open the artery at the top of the hand.

In other words, in spite of close contact from childhood with this active shrine of Aesculapius, this highly educated physician endowed with the spirit of investigation which made him the Father of Experimental Physiology retained the sublimest faith in its probity and accomplishments.

There was a limit, however, to even his credulity in the absurdities of mythology sometimes believed in by the ignorant. In the theater of the shrine stood among others a statue of the centaur Cheiron, described in mythology as the caretaker of the infant Aesculapius. At Cheiron and similar combinations of man and beast Galen explodes mirthfully (iii, 170–173). "I would like to see a centaur building a house," he says, "or climbing the masts of a ship. . . . How would he sit down? Where would he place his book [to read or write]? . . . [23] Common people believe it is only man that stands upright, rather is it only man that sits down."

Likewise he took merely as pretty poetical fables the story of Venus rising from the foam of the sea (iv, 531) and of Minerva springing from the brain of Jove and Jove's birth in Crete (xiii, 271). In augurs and diviners he also placed no reliance since in his travels he had seen too often the same omen interpreted in opposite ways (xv, 441). Nor did he believe that disease was ever occasioned by the gods, not even epilepsy or love, though the former was popularly known as the sacred disease. As to the latter no matter how pale or emaciated or sleepless or even feverish the lover becomes this is the result of natural, not divine causes (xviii$_2$, 18, 19).

It is frequently asserted that Paganism was merely a ceremonial upheld by politics, but the more we read of Galen the more it is evident it took the same possession of the mind and heart as religion today. Our physician was not only a sincere but an ardent believer. He saw burlesque and charlatanism only in other creeds, not in his own, to which he adhered throughout life with love and veneration. About the age of forty-four, at the height of his intellectual vigor, he dedicated (iii, 237) what he considered his masterpiece and what is still looked on as one of the greatest of experimental physiological investigations (entitled the Use of the Parts) as a "hymn of glory to the Creator of Man." In fact in the epilogue to this treatise he states (iv, 360): "This research on the use of the parts, which at first appeared of little moment, constitutes the foundation of a perfect theology, a greater work and much more important than all of medicine."

Eventually after the age of sixty we have from his pen (v, 1–103) a moral treatise on human passions and their correction, worthy of a father of the early Christian Church. It deals with anger (Θυμὸς), lust (ὀργὴ),[24] fear, excessive grief or melancholy, envy and covetousness or avarice. The last is made to include also gluttony in eating and drinking. In it he advises an examination of conscience each evening to learn wherein we failed during the day and a resolve each morning to improve.

This work, entitled "Recognition and Treatment of Passions and Errors of the Soul," has been translated into modern French by Robert van der Elst.[25] Lexicographer that he was, Galen's definitions, usually clear and unequivocal, are no less so for these two terms: "Error," he says, "is the result of false judgment or opinion; passion, of unbridled energy rebellious to reason." The sins called capital or deadly in modern catechisms are: pride, covetousness, lust, anger, gluttony, envy and sloth. Galen omits the last, includes pride more or less under covetousness, and adds fear and melancholy.

In addition, he wrote (xix, 45, 46) a number of other articles on morals, among them: On the Equality of Sin and Punishment, Pleasure and Work, Modesty, Calumny, the Slight Significance of Popular Honor and Glory, and the Refusal to Divulge Knowledge. The last had to do with teachers who deliberately withheld a certain amount of knowledge gained by special study or investigation so as to retain this advantage over the pupil. As we shall see Galen appears to have been one of the few physicians of the time who kept nothing to himself.

From his writings we learn that he believed in a Supreme Being, eternal and uncreated (iv, 815). This Being was almost but not quite almighty (iii, 905),[26] since matter being also eternal and uncreated He was limited by its constitution and could not change its characteristics. In fact, the Pergamite definitely puts himself in opposition to the Jews who believed their god omnipotent.

"Is Moses' solution of the natural questions better than that of Epicurus?" he asks, and at once answers:

> In my opinion it is preferable to adopt neither one nor the other, but while allowing like Moses the beginnings of generated things through a Creator, to take into consideration also the qualities of matter. . . . For Moses it was possible to God to make a horse or a cow from dust. We doubt this, believing certain things are impossible in nature and that God far from refuting, shows Himself content with doing the best among the possible. . . . This is how the opinion of Moses differs from ours and that of Plato and the other Greek philosophers who have treated these natural questions.

He believed also in lesser gods, particularly Aesculapius, the patron of the art of healing. Whether he had been born a god or was originally a mortal who proved himself worthy to be given a place among the celestial hierarchy, Galen was not prepared to say (I, 22). He believed that Hippocrates (III, 21, 22) was surely in heaven, and though he had no hesitation in venerating him as what would be described today a saint, he thought it possible he might have become an actual god. He lived in the hope of meeting him in the future and regulated his conduct accordingly (XII, 252). These beliefs will be brought out in the description of individual writings. And in the regulation of his conduct out of veneration for Aesculapius and Hippocrates we shall see how he raised the ethical standard of the Practice of Medicine, though these beliefs so prejudiced him that he repudiated important theories and inquiries suggested by his *bête noires*, the atheists.

Delicate in early boyhood (VI, 308, 755), his devoted (V, 41) father, Nikon by name, a successful architect[27] with high ideals, personally instructed, or at least superintended his instruction in the elements, and it is only at the age of fourteen (Autumn of 144) we hear of him leaving his father's side to attend the philosophical schools. He tells us that his father taught him grammar, logic, arithmetic and geometry (XIX, 40, 43, 59). At the age of seventeen (XIX, 59) we find him studying medicine.

Quoting his own words (V, 41):

> After I had completed my fourteenth year, I studied under philosophers in Pergamum, for the longest time under a stoic, a pupil of Philopator, and a short while under a Platonist, a pupil of Gaius. His instruction was brought to a close by his election to an official position because he was a man of integrity, contemptuous of money, affable, and easy of approach. Subsequently another philosopher, a pupil of the peripatetic Aspasius, one of our own citizens returned home after traveling extensively and still later an Epicurean from Athens came to Pergamum, and after my father had investigated their lives and doctrines, I went to them.

Practically speaking Stoicism was not only a philosophy, but a rule of conduct advocated by the officials and adopted by the righteous. It was almost the only one of the schools which admitted and respected an infinitely wise and good Providence.[28] While a Stoic always in this sense, in philosophy in general he became sufficiently an Eclectic to amalgamate the principles of Pythagoras, Plato, Aristotle and Chrysippus, though he never took to the Cynics or Epicurus.

The sect of the last had just come into more prominence at the time of his birth during the reign of the Emperor Hadrian.

We know nothing of Philopator, but Aspasius, to whom he also refers, was the most celebrated Peripatetic of his day. Aspasius wrote commentaries on the Categories, De Interpretatione and De Sensu of Aristotle, on the first two of which Galen likewise discoursed (XIX, 42).

Van der Elst[29] suggests the Gaius referred to may have been the celebrated juriconsult, one of the most eminent members of the bar at the time when law was making greater strides than at any period in history. He was almost twenty years older than Galen, in other words, about the age to have taught his teacher. Van der Elst thinks he may have taught philosophy in his earlier years.

Another man of eminence in Pergamum whom Galen does not mention, at least by name, was the noble born and flashy rhetorician Aristocles, about ten years his senior. That our enthusiastic student heard him lecture can scarcely be doubted; that he attended his sophistical course is unlikely. In this great age of rhetoricians, the three most prominent were Polemon of Smyrna, Favorinus of Rome[30] and Herodes Atticus of Athens, who was also the world's best known multimillionaire philanthropist. Galen quotes the first (XVIII$_1$, 347) and wrote an article against the philosophical opinions of the second (XIX, 44).

The fame of Aristocles as an orator became so great that Herodes Atticus with all his pupils traveled from Athens to Pergamum to hear him.[31] It is barely possible he was the native citizen, the extensive traveler, and the pupil of Aspasius to whom Galen refers as his third teacher of philosophy. For in spite of the fact that his family was of consular rank, Aristocles began life as a modest, unassuming philosopher of the peripatetic school and only after studying under Herodes Atticus in Rome, became a flamboyant Sophist.[32]

The fact Galen fails to mention the names of his actual teachers of philosophy (though he omits none of his teachers of medicine) tends to the opinion that they failed to become eminent or changed so in later life that he deemed them if not unworthy at least not worth commemorating. We know, for instance, that Julius Pollux, one of the early philosophical teachers of Commodus chosen by the careful Marcus Aurelius, became subsequently a scandal to the educators of the day.

Apparently even before he began studying under the preceptors he describes he had commenced to write since he tells us (XIX, 43): "As a boy (παῖς under the age of fourteen), while my father was instructing me in the doctrines of Chrysippus and the other celebrated stoics, I wrote three books[33] of Commentaries on the syllogistic works of Chrysippus." He further proudly boasts that twenty years later he "found these with many commentaries I had written in my teens (μειράκιον) still in existence having been published by a slave who had asked for them."

Ilberg believes the other commentaries were on treatises of Plato, Aristotle, Theophrastus and Eudemus, and he mentions[34] particularly the following from Galen's catalogue of his own works (XIX, 43-47): one book on the School of Plato, three books on personal opinions, one on logical theory, one on transitions in the Philebus and eight synopses of the dialogues of Plato which were probably written for the sake of personal orientation; three books on the hermeneutics or interpretation of Aristotle, four on syllogisms or prior analytics and four on demonstration or posterior analytics; six books on the affirmation and negation of Theophrastus, and one on the prior analytics of Eudemus. From his description (xix, 42) it would appear that the last mentioned was the first work Galen actually published.

Among the early writings elevating him to prominence were lexicons compiled during his postgraduate course in Alexandria. These philosophical studies leading as they do to proper definition and elucidation constituted his preparation for them.

The slave whom he describes as publishing these writings was probably one belonging to his own family, even one who may have aided in his elementary education. Needless to say growing youngsters became very familiar with these caretakers called pedagogues who reciprocated with loyalty. Slaves were so common that even poor families owned one, while the well-to-do boasted of many, even into the hundreds.

The most frequent slaves on the market during his boyhood were Jews due to their uprising and complete conquest when he was five years old. The number was so great that the price lowered to that of a horse.[35] Since he tells us later (ii, 233) of slaves helping with his dissections, it is not impossible that a secretary or technical assistant with Jewish self-reliance, concentration and pertinacity aided in some of his brilliant work.

When Galen entered philosophy his leanings were so in this direction that he determined to follow it as a career (xix, 59). In fact though he changed later he never forgot this first love and extended to it the devotion of an ardent student and prolific writer. It was not an avocation from which riches were to be expected, but his family was sufficiently well-to-do to make this an unnecessary consideration. In addition, brought up as he was in affluence without obligation to recognize money as a need, he readily acquired his father's contempt of it and retained this attitude throughout life.

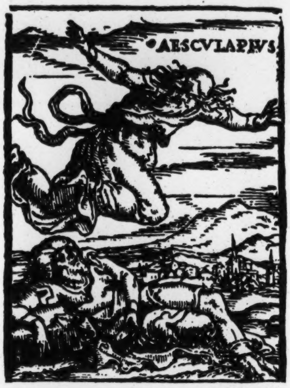

Fig. 5. Aesculapius Inspiring Galen's Father in a Dream to Send His Son into the Study of Medicine. From the Junta Edition Galeni Opera Omnia, 1586.

In the midst of the philosophical course, at the age of sixteen, dreams of his father believed to be inspired by Aesculapius, urging the boy into medicine, brought about his entrance to this profession (x, 609; xvi, 222; xix, 59). With our knowledge of conditions in Pergamum, however, it is not difficult to see how these dreams might occur apart from the god's inspiration.

There had come to Pergamum (ii, 224) from the Capital, the eminent architect L. Cuspius Pactumeius Rufinus, consul in 142,[36] for the purpose of rehabilitating the shrine of the god of medicine. He rebuilt so much of it, and was responsible for so many other improvements in Pergamum proper, that he was popularly known as the Founder of the City. It was undoubtedly due to his work that the shrine was reckoned in later times among the wonders of the world.

During Galen's philosophical course there had come up from Smyrna the highly regarded teacher of anatomy (xv, 136) and Hippocratic medicine, Satyrus, who took up lodgings with the Roman architect for the short time he intended to remain, though Galen boasts he eventually stayed four years (II, 224). It would appear he came to Pergamum as instructor though later he returned to the more important Smyrna.

With Nikon's admiration and friendship for the brother architect Rufinus, as would seem to be indicated by Galen's references, and the presence of Satyrus in the same household, it requires but little imagination to conjure up conversations on Aesculapius and the profession of medicine. From the lips of Satyrus, Nikon and possibly also Galen must have heard time and again about Hippocrates, the fascinating study of the body and how much still remained to be learned.

With the miracle-working shrine in the background and the religious enthusiasm of Rufinus and Nikon in the fore, with the medical zeal of Satyrus making him eloquent and the inclination of Nikon and Galen to science making them receptive, it is easy to understand how the thoughts of both were directed to medicine and how Nikon should dream of his son following this profession.

At the age of seventeen (September 147) then we find him at the study of medicine which he continued in his native city for four years. As previously he had gone to teachers of various philosophical schools, he now, on the continued direction of his father, put himself under physicians of different medical sects so as not to limit his knowledge. There were at the time four principal sects: Dogmatism, Empiricism, Pneumatism and Methodology.[37] The two former were products of the East and numbered many adherents, the two latter were founded in Rome and were less popular in Asia Minor.[38]

Since Galen mentions no Methodologist among his early teachers it is possible there was none in this city of Aesculapius—acknowledged atheists or at least agnostics as they were without belief in the providence of the gods. To them the human body was not a special creation, but an accidental aggregation of atoms which developed its functions by evolution. The faith-loving, as were most of the inhabitants of Pergamum, including Galen, looked on them with detestation and fear of heavenly wrath. Yet in spite of his piety, and his prejudice toward this sect, he later in Alexandria attended the course of Julian, its most prolific writer, showing that he was willing to risk even faith in the pursuit of knowledge.

One of his first medical instructors was a Pneumatist who proved devoid of both talent and judgment, and the bright boy quickly left him. In his others he was more successful, namely, the Dogmatists Satyrus, Stratonicus and Ephicianus, and the Empiric Aeschrio. Satyrus, whose education and social standing are shown by the fact that he dwelt with the bril-

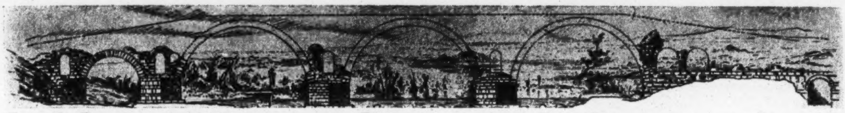

Fig. 6. Present Appearance of the Ruins of the 300 Foot Bridge over the Caicus River Crossed by Galen and His Father on Their Visits to and from the Farm in the Country. The Arches Have Been Diagrammatically Completed to Show the Elevation. The Large Ones Are 62 Feet Wide.

liant Roman architect and consular, taught anatomy (xv, 136), surgery (ii, 224), therapeutics and Hippocratic medicine (xvi, 524), and it would appear that it was to him Galen owed his beginning enthusiasm in these branches. We know (xiv, 69) it was from him he first heard of the theriac on which he did so much work and so much writing late in life, and which he prescribed for the Emperors Marcus Aurelius and Septimius Severus.[39]

Satyrus himself had been a pupil of the celebrated Empiric Quintus (ii, 217, 224; xiv, 69; xix, 58) who died shortly before Galen took up medicine (ii, 225). Quintus was apparently a born teacher. Not only did his pupils almost worship him, but a number became eminent. In fact Galen takes particular pains to describe many of the contemporary physicians whom he mentions in a laudatory way—Satyrus, Pelops, Numesianus and Antigenes (xiv, 613)—as students of this beloved and renowned master.

They even took pride in the fact that he was sufficiently prominent to suffer the fate of illustrious predecessors, for as Anaxagoras was condemned, Socrates executed and Aristotle sent into exile for corrupting the youth to whom they were trying to teach virtue, Quintus was driven from Rome[40] for killing the sick (xiv, 602). In his commentaries on Hippocrates, Satyrus claimed he followed Quintus word for word (xix, 58), and this is the only subject on which Galen totally disagrees with them, their interpretation of the master.

Like Socrates, Quintus left no personal writings (xv, 136), not even on dissection which was his forte (xix, 22) though he also taught therapeutics (vi, 228; xii, 15; xiv, 71) and commentated on Hippocrates. He was in turn a pupil of Marinus to whom Galen gives unstinted praise and calls the restorer of anatomy (v, 650). In fact after making quite a number of discoveries, the Pergamite thought for some time of only adding to the satisfactory textbook of this author instead of writing a new one.

Our student describes with enthusiasm an anatomico-surgical clinic he saw under Satyrus (ii, 224). An epidemic of carbuncles prevailing, Satyrus on opening one near a joint took occasion to point out on the floor the various muscular structures and even exhibited them in movement. He also drew aside the muscles and showed the large arteries and nerves. Galen adds these demonstrations were particularly instructive to students who already knew something of anatomy from previously dissecting animals. He himself had special opportunities in this regard on his father's farm of which we will speak later. Since Galen goes out of the way to tell us[40] that Satyrus was one of the pupils of Quintus best acquainted with his anatomical teachings it was apparently from Satyrus he derived the ardent love of anatomy he manifested throughout life.

He refers to Stratonicus in connection with the healing of an old bone wound, but principally in connection with treatment by venesection (v, 119). Fifteen years later in Rome we shall find Galen in an acrimonious discussion with the physicians, some of them of the highest repute, as to merits of this procedure. Hippocrates employed it rather freely, but one hundred and fifty years later it was condemned by Erasistratus. There was a popular sect of Erasistrateans in the Capital, and they together with the Methodologists opposed it.

This first case of treatment by venesection was one of varicose ulcer which he details as follows:

> After a man had an ulcer on his thigh for a long time, the veins lying above it which were varicose, were excised. Immediately the ulcer healed. Yet the incision by means of which the veins were removed did not get well. Later in the year, one of my preceptors at Pergamum, Stratonicus, a disciple of Sabinus Hippocrates, opened the vein at the elbow and when he saw the escaping blood thick and black he repeated the venesection for four days. In addition he purged the black humor by medicaments, prescribed a nourishing diet, and thus healed the ulcer.

As he relates, this teacher had been a pupil of Sabinus Hippocrates, one of the commentators on the great Hippocrates, whom with Rufus of Ephesus Galen esteemed most highly (xix, 58). With all his regard for him, however, he disagrees with many of his interpretations of the Father of Medicine (xvii$_1$, 508).

Ephicianus[41] he tells us (xix, 58) was a Dogmatist with a Stoic point of view. This means that practically speaking he was a Pneumatist. Dogmatism antedated Zeno, and it was the doctrines of Stoicism which more or less created Pneumatism. It was also Zeno who changed the teaching method followed up to his time and made medical theory an object of dialectics.[42] Neglecting no knowledge which appeared to him true or useful, Galen accepted many of the physiological and pathological explanations[43] of the Pneumatists apparently heard for the first time from Ephicianus.

As might be expected Aeschrio, the old Empiric past the age of sixty-five, taught him therapeutics (xii, 356) since treatment was the specialty of this sect. Refusing to delve into physiology and etiology the Empirics took as a slogan, "It is indifferent what causes disease, it is important only to know how to cure it." In his later crusade against sectarianism, Galen roundly condemns their attitude.

In addition, he mentions two other physicians in Pergamum at the time, Philippus, a prominent Empiric (xix, 16), to whom we shall refer later, and Eudemus, an old man worthy of respect (x, 454).

Exactly the methods of his teachers are unknown, except that anatomy and physiology were studied on animals, especially apes,[44] and some if not considerable of the clinical instruction was at the bedside. The latter is inferred from his vehement denunciation of the Methodologists in Alexandria[45] for neglecting it (xvii$_1$, 806).

In general what was taught is evident from the knowledge Galen displays throughout his writings and the manner in which he examined, diagnosed and treated cases. A definite history was taken (viii, 8, 18) not unlike that of today relating to previous affections and operations, the occupation, whether sedentary or active, indoors or out, the manner of living, the amount of rest, present or recent worries, and the habits of eating and drinking (xi, 80). On account of the prevalence of malaria in the neighborhood of swamps (vii, 290) the location of the residence was of importance; on account of the prevalence of elephantiasis here and leprosy there, recent travels were inquired into.

The patient was allowed to tell his own story of the existing complaint and the factors leading up to it. The regulation questions were asked as to chills, fever, cough, expectoration, hemoptysis, dyspnea, pain, tenderness, sweats, edema or other swellings, appetite, belching, vomiting, bowel movements and urination.

They examined the patient's hair, eyes (xi, 11), ears, nose, mouth, teeth, tongue, throat, hands, nails (viii, 47) and skin. Removing the clothing they looked over the chest and back for deviations from the normal, like kyphosis and increased or diminished expansion of the chest. They palpated various parts (viii, 10), especially the abdomen, for tumors and enlarged liver or spleen (viii, 45, 125). The increase of the latter in malaria led them to believe this was the seat of the disease and on account of its frequency, this examination was never omitted.

They missed no external hernia and differentiated satisfactorily between ascites and tympanites, partly by palpation and partly by percussion since the latter gave a tympanitic note (*ωςπερ τύμπανον* x, 963). They sought for both external and internal hemorrhoids. Fever was judged by the subjective sensations of the patient and by the physician's feel of the skin as well as by the pulse.

They scrutinized the sputum, vomit, urine and feces. The different kinds of sputum aided in differentiating asthma, acute bronchitis, pneumonia, phthisis, pyopneumothorax and pleural effusion. In hemoptysis they drew conclusions from the color of the blood and whether or not it was clotted. In phthisis if the sputum thrown on a charcoal fire gave off an offensive odor, the prognosis of the case was grave (xvii$_2$, 796).

Concentration of the urine helped in diagnosing fever (xi, 8, 24) and other constitutional disturbances, its quantity and taste in diagnosing diabetes. They looked also for blood, pus and gravel. In urethritis they learned that the pus was in the first part of the passed urine, in fact their differentiation of urethritis, inflammation of the bladder and vesical calculus is classical (viii, 12–14, 439).[46]

The feces were differentiated into scybalous, hard, normally formed, soft and liquid, and into normal or fetid in odor. They examined for the presence of tape, round and seat worms (viii, 47; x, 1004), blood, bile (ii, 40), pus and mucus. Membranous colitis was recognized (viii, 43). In inflammation of the intestines they tried to differentiate the part diseased—duodenum, small intestine, or colon—from the state of digestion of certain foodstuffs (viii, 42).

As we review his work a certain number of individual cases with their history and treatment will be reported which have a bearing on his writings or investigations, but this number is so small that to put the reader more *en rapport* with his actual studies and practice, occasion is taken to mention by name the majority of common conditions he learned about from his teachers, and to which he thought he added further knowledge:

Pulmonary consumption with its panicky symptom hemoptysis, both of which were well handled,[47] scrofula, pneumonia, diphtheria, erysipelas, tetanus, bubonic plague, leprosy, quotidian, tertian and quartan malaria, jaundice, smallpox and other eruptive fevers, rheumatism, mumps with which they recognized extension to the testicle,[48] rabies, tapeworm, roundworms, scabies, pediculosis, elephantiasis, alcoholism, acute and chronic, opiumism, acute and habitual, mushroom poisoning, gout, diabetes mellitus and insipidus, obesity, stomatitis, tonsillitis, pharyngitis, quinsy, indigestion, hematemesis, diarrhea, dysentery, constipation, colic, intestinal obstruction (II, 195), hernia, peritonitis, subphrenic abscess, ischiorectal abscess, rhinitis, epistaxis, laryngitis, bronchitis, asthma, dyspnea, emphysema, pleurisy with and without effusion, empyema, pneumothorax, palpitation, cardiac disease (VIII, 293–296), oliguria, anuria, hematuria, pyuria, nephritis, nephrolithiasis, stone in the bladder, splenic tumor, arthritis deformans, lumbago, neuralgia, neuritis, menstrual pain, menorrhagia, leucorrhea, nymphomania, satyriasis, priapism, apoplexy, dementia, delirium, coma, paralysis, tremors, convulsions, chorea, epilepsy, neurasthenia, hysteria, traumatic neuroses (VIII, 213), sunstroke, migraine, headache due to overwork, overindulgence in wine and brain tumors, earache, toothache, ophthalmias, cataract, frostbite, chilblains, burns and scalds, sunburn, dermatitis venenata, bedsores, acne, furuncles, carbuncles, bites of mosquitoes, bees, wasps and snakes, pruritus, urticaria, alopecia in its various forms, warts, tumors, cancer, varicose veins and varicose ulcers.[49]

In spite of their capability of differentiating all of these from one another, there existed an endeavor, particularly on the part of the Methodologists and Pneumatists, to simplify classification by reducing the number of diseases, and caught in this tendency, Galen and his contemporaries frequently included several which were treated in the same general way under one head. For instance, under the term "pest" were included the fulminant contagious diseases which occurred in epidemic form such as smallpox and bubonic plague. It is possible even that the term included typhus and influenza, though the descriptions are insufficient to allow positive recognition. The pests and others of these diseases will be spoken of again, hence the omission of references to Galen's description of them.

The number of recoveries, even of serious diseases like malaria, diphtheria (VIII, 54), pneumonia and other infections, was not small, apparently due to the rest in bed, though active treatment was given most of the credit. As a consequence when death resulted other remedies were substituted or added till the pharmacopeia became an encyclopedia of botanical specimens and animal products.

Only a small number of these are in use today, among the principal being opium, hyoscyamus, tannic acid, chalk, ginger, aloes, scammony, colocynth, cassia, rhubarb, castor oil, olive oil, barley water, licorice, turpentine, squills, ammonium chloride, sulphur, zinc oxide, copper sulphate, valerian, gentian, cardamom, cinnamon and various balsams and gums. They had supposed hydragogues, cholagogues like scammony (II, 41, 42; XII, 382), expectorants and analogous preparations without number. They had more highly recommended remedies for alopecia than a dozen modern barbers (XII, 392 et seq.) and more depilatories than are advertised in our daily newspapers. In addition we still employ, though not to the same extent, massage, ointments, baths, mustard plasters, cups and venesection.

With evidence before them leading to the proper treatment they sometimes remained confused as in the case of scabies, which was one of their most common affections. Not knowing its cause they put it in the general category of constitutional diseases with scrofula, leprosy and gout, and though sulphur ointment was sometimes employed they failed to recognize it as a specific and thought the cure in these cases was the result of the action of the ointment on the humoral composition of the body and under other humoral conditions a different ointment was necessary.

They believed the ultimate elements of matter were fire, air, water and earth, represented in the body by heat, coldness, moisture and dryness. Since disease was due to an improper proportion of these, every remedy had to be considered in regard to its capability of influencing the excess or diminution of one or the other (XII, 246, 287) while additional consideration had to be given to the natural temperature and dryness of the patient himself. For instance, an ulcer on the leg required drier remedies in the case of an infant (with moist flesh) than of an old man (with wrinkled-up dry flesh).

In surgery Galen learned how to handle dislocations and fractures, simple, compound and comminuted, in fact, diagnosed and treated them apparently as well as we succeeded before the advent of the *x*-ray. Fractures of the skull, depressed and not depressed, were recognized and the trephine used when required. They became adepts with the roller bandage.

It is only necessary to mention some of the operations to realize the thorough course he must have had. Incised wounds were brought together by bandaging or by stitches (X, 189). Vessels were ligatured (X, 319). They corrected harelip (X, 1014) and amputated supernumerary fingers (X, 991). They removed cancers, polyps, fibromas, myxomas, lipomas, cysts and warts (X, 158). They reduced and operated upon benign and strangulated hernia.

In case of suspected stone they used the sound and rarely failed in diagnosis. They removed it either by perineal operation or lithothrity. In inflammation of the bladder they irrigated through a catheter (VIII, 11–13). In empyema a cannula was introduced, the pus removed and the cavity irrigated with melicratum (a mixture of honey and water), the patient blowing his nose in order to force out the fluid. When necessary a portion of a rib was resected (X, 340). Ascites was treated by paracentesis (X, 987).

During this four-year course in medicine he wrote (XIX, 16) what he describes as a very small[33] book, but what we would call an article or a paper on dissection of the uterus, which was given to a midwife; a small book on diagnosis of eye diseases, which was given to a confrere studying ophthalmology (ὀφθαλμοὺς θεραπεύοντι νεανίσκω).[50] He also transcribed in a "book of some size" a two-day debate between the well-known Dogmatist Pelops of Smyrna and the Pergamenian Empiric Philippus, Pelops taking the ground that medicine could not be based on experience alone, Philippus the opposite side. The participation of the eminent Smyrniote, who was probably one of the three or four most renowned medical men in the Empire (xv, 136) shows the high standing of his opponent. Later we shall find Galen visiting Smyrna to study under the great Pelops. It is possible he failed to put himself under Philippus because he was too radical an Empiric for one already interested in philosophical speculation who had begun his medical studies under the ardent Dogmatist Satyrus.

Extant is a treatise on the Anatomy of the Uterus (ii, 887–908) which Ilberg[50] believes may be the work he gave to the midwife. If so it stands as the first on medicine he wrote, though it was undoubtedly added to on publication at about the age of forty. He shows acquaintanceship with dissection of the pig, sheep, goat, deer and cow. In it he quotes or refers to Hippocrates, Herophilus, Diocles, Eudemus, Praxagoras, Philotinus and Aristotle, but not the great gynecologist Soranus of Ephesus, possibly because he was a Methodologist (x, 53) though modern criticism gives him the highest place among the ancients in this specialty. Among those he mentions the greatest authority was Herophilus.[51] Considering it was written for a midwife, Ilberg finds it rife with superfluous scientific detail, but this criticism applies equally to the works which we put into the hands of trained nurses in whom higher education is demanded even less than in their midwives who were the actual obstetricians.

Though of little importance in itself, since it was not a subject on which he increased human knowledge, this first paper on the uterus has furnished anatomists and gynecologists with a basis for the crude jest when beginning their lectures on the female genitalia, that they are now about to discourse on a totally superfluous subject, since every medical student has already mastered it.

The other two papers are lost. The first of these is his primary article on the eye on which he subsequently made a sufficient number of discoveries to lead him to believe, at about the age of forty-four, that he had solved the problem of vision. His solution was so different from the ideas in vogue that he hesitated to proclaim it, in fact, delayed its publication till so ordered by Aesculapius in a dream (iii, 812). Though some of his discoveries on the eye have stood the test of time and redound to his repute, others were not so fortunate and with their discrediting fell his proud solution in spite of the gods' approval.

The third paper represents his introduction to the study of medical sectarianism. Aroused in Alexandria, and later in Rome, by the vagaries of the different sects he began a crusade against all which he kept up throughout life, leaving us a legacy of twenty-two more articles on this subject. Even as a student Ilberg[19] believes that he was active in discussion, and that his teachers had to be wary or expect sharp contradiction (vii, 558 et seq., viii, 198).

In the third year of his medical course, while he was nineteen (vi, 756) his father passed away,[52] leaving him a competence (v, 48) which made him reasonably independent for life. For though conditions were more precarious even than now, and incomes were lost with greater ease, Galen had the prudence combined with good fortune to preserve at least sufficient to the end.[53]

This is evident from his statements after the age of sixty (v, 48): "I guard in reserve," he says, "at least the patrimony left by my father, having lost nothing of importance though also without increasing the revenue." And again (v, 43): "Loss of possessions does not affect me, provided it is not the loss of all, a misfortune I have not yet experienced . . . in fact whatever loss I have suffered has not yet reached such proportions but with what remains I am still able to take care of my health." This appears to mean that he has not only sufficient for maintenance, but for the relaxation and vacations necessary to keeping well, in fact he portrays (v, 50) himself as "in easy circumstances."

In this connection he describes (v, 44–48) a man with twice as much worldly goods as capable of living on one-tenth of his income, since obsessed with the desire to become rich he spent nothing on charity, the accumulation of a library or the publication of books. From this we surmise that Galen could possibly have lived on about one-fifth of his income which was only exhausted "by sharing clothes with this one, giving nourishment and free medical care to another, paying the debts of a third," and to an even greater extent by purchase of books and engaging copyists for the publication of writings. This makes it appear that his father left him an income of two to four thousand dollars a year, which was supplemented by the practice of medicine. Interrupted, however, as this was by change of residence, the income varied from nothing to possibly seven or eight thousand. The largest sum he apparently ever received for a single case (it was a serious one lasting two months with oversight during several more) was four hundred gold pieces (xiv, 647), amounting to about seventeen hundred dollars.

Though he anointed his body each morning and evening for the sake of health he assures us (vi, 228) "it was not, by Zeus, after the fashion to which Quintus objected. To an athlete inquiring as to what ointment was the best Quintus responded, 'that put on under the clothes.'" This means, of course, not put on the head for the purpose of perfuming or slicking down the hair. In a similar way, unlike the Sophists of the time, jewelry, rich habiliments and luxury in general had for him no appeal (v, 46).[54] He dressed and lived in the simplicity of a sincere Stoic philosopher, though we have no reason to believe out of keeping with the dignity of a prosperous physician of high standing.

The adjuration "by Zeus!" in Greek μὰ Δία was about as common in everyday speech as "Mon Dieu!," which it so closely resembles, in French. He employs it frequently (ii, 76, 203; xviii$_1$, 180, 219), though he also expresses it sometimes by (viii, 158) ὦ πρὸς Διός. Other favorites of his were (x, 265; viii, 117, 143, 146) "by the gods!" (ὦ πρὸς θεῶν or again νὴ τοὺς θεοὺς) and "calling the gods to witness" (θεοὺς μάρτυρας). He indulges in these petty profanities so often in his writings that it is evident one of them must have escaped from his lips in almost every conversation and address.

They represent one of many indications pointing to petulance and impatience to contradiction, and even then tended to indicate poverty of language being more frequent in the speech of the uneducated. Yet in his letters to his pupil Marcus Aurelius, the highly cultured rhetorician Fronto employs μὰ Δία, νὴ τοὺς θεοὺς and others,[55] and even in the Meditations of the saintly Marcus himself we find occasionally the same expressions,[56] though pious ejaculations like "the gods favoring," "the gods aiding" are more frequent and seem more natural from his seraphic pen.

In the differences of opinion met on every side he had found his father a faithful guide, now thrown on his own resources he fell, he tells us, into almost absolute skepticism. The competence, however, permitted him to travel and complete his education, and somewhat more than a year later in the Summer or Fall of 151 he betook himself to Smyrna, where his highly regarded teacher Satyrus had gone not long before.

That he was brilliant even to precociousness we have seen in that he began his writing at the age of thirteen; that he was devoted to study and applied himself even to impairment of health is indicated in this tribute to his father written after the age of fifty-nine and published at about sixty-three (VI, 755):

> As a boy my father kept me free from disease by his rational way of living. When I became a youth, however, and he was occupying himself with experiments in agriculture, I urged myself above my companions to such a degree that I was studying both day and night. Not yet satisfied I continued my studies during the dog days [148 A.D.] living almost only on fruit which on account of the season was already overripe. As a consequence in the autumn I was attacked by an acute disease for which it was necessary to be bled.
>
> Returning to town my father reprimanded me and called to mind my previous rational way of living which I had learned from him. He ordered that I revert to this and divorce myself from the random ways of my companions. During the following year he observed carefully my manner of living and I refrained from fruit except in moderation. Hence I passed my nineteenth year [September 148 to September 149] in perfect health. The following year, however, he died, and becoming too liberal again in my use of fruit in the dog days [150 A.D.] I was attacked by a similar disease for which I was bled again.

How much his father meant to him in the way of direction and advice is pointed out also in other places: "My father," Galen tells us (V, 42; VI, 755) "was well versed in geometry, arithmetic, architecture, logic and astronomy. He desired me to learn geometry on account of its demonstrable conclusions in regard to which there is no controversy and teachers of all schools agree." In other words, he wished him to have experience with a study in which the proofs were irrefragable and in which there was no question of sects. And Galen was so impressed that we shall find him later endeavoring to put the science of medicine on as conclusive a basis.

"As desirable as are all sciences, however," said his father, "more desirable still are the virtues of justice, temperance, fortitude and prudence, —virtues extolled by everybody, even those who have them not."[57] And with respect and veneration evident in every line Galen assures us more than forty years later (v, 43):

> The precepts learned from my father I have followed to this day. I profess no sect though I have studied all with the same industry and ardor, and like my father I dwell without fear as to the daily happenings of life. . . . My father taught me to despise the opinion and esteem of others and to seek only truth. . . . He insisted further [v, 44] that the primary end of personal possessions is to relieve hunger, thirst and nakedness, and if more than sufficient remains it should be transmuted into good works.

In addition to being a well-educated architect, his father was lauded by acquaintances for equity, honesty and temperance (VI, 755). Thus it is quite evident whence came Galen's uprightness, his piety and his devotion to culture.

Considering the commendations bestowed on his father whom he calls the mildest, most just and most devoted, it is somewhat of a shock to find (v, 41) in the same work the following description of his other parent: "My mother," he says, "on the contrary was irritable to the point of sometimes biting her maids,[58] scolding always and quarrelling with my father like Xanthippe with Socrates. . . . And while he was not affected by the most serious, she choked with anger over the pettiest inconvenience."

This, however, is evidently the heritage making for the son's irascibility, and possibly not without fruit. For it is quite likely if he had been of Nikon's easy-going disposition he would not have opposed so earnestly or written so brilliantly against the different medical sects of the time.

The article exhibiting these tributes to his father and the criticism of his mother, namely, Recognition and Treatment of Passions and Errors of the Soul,[25] was written for a rich man who, wishing to improve himself, requested Galen to point out his faults. It was not uncommon for the affluent to employ occasionally, or engage permanently, a household philosopher to observe and correct their morals. In this discourse Galen takes cognizance of the vices anger, lust, fear, excessive grief, envy and avarice. Intending to point out in the solicitor the fault of avarice, he begins by showing that whatever virtues he (Galen) possesses were not a cause for self congratulation since they were due to his remarkable father and his careful upbringing; also in part to his mother's defects which were so glaring that he could not help being repelled by them. It is quite evident he is endeavoring by a display of modesty to implant his counsel so it will be followed.

While Galen's actions throughout life proclaim him sincere, they also show that when aroused his language frequently exceeded the bounds of moderation. Though we have no reason then to doubt this description of his mother, the fact that he recalled her in this fashion after the age of sixty makes it probable that they had a special disagreement. The most likely time for this was after his father's death, and the most likely subject that of his father's will.

Contests over wills have been the cause of estrangement in families from the beginning of history, and comparatively few families with possessions escape them. We read of lawsuit after lawsuit in the second century involving Marcus Aurelius, the multimillionaire rhetorician Herodes Atticus and many others.

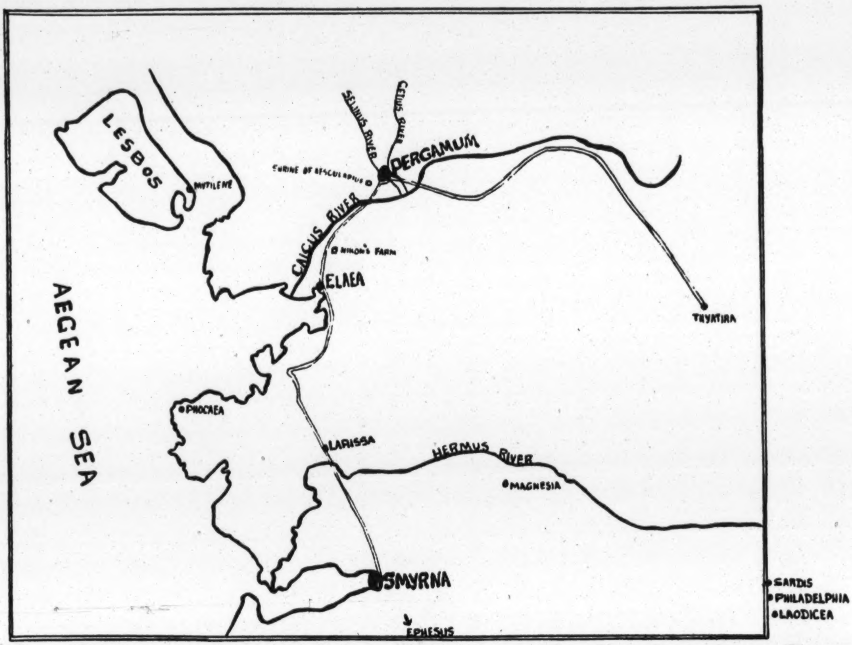

Fig. 7. Pergamum and Vicinity. A Covered Passageway 3000 Feet Long Connected the Town with the Shrine. A Splendid Road Extended 14 Miles to Its Seaport Elaea. On the Left Side of This Road between Pergamum and Elaea Is Indicated about the Location of the Farm Owned by Galen's Father. The Farm House Was Pretentious, Well Back from the Road and Faced South. His First Year of Postgraduate Work Was in Smyrna, 50 Miles to the South. His First Medical Promulgation Outside of His Native City after Beginning Practice Was before the Physicians of Larissa. The Seven Patriarchal Churches to Which St. John Addressed the Revelation, about Thirty-five Years before Galen's Birth, Were in Pergamum, Smyrna, Ephesus, Thyatira, Sardis, Philadelphia and Laodicea, Tending to Show in Them a Strong Jewish and Beginning Christian Settlement.

While his one year in Smyrna is easily accounted for by postgraduate work, his protracted stay of five years in Alexandria, even though we know he continued his studies, requires additional explanation. For not only did he study in Alexandria, but accepted a position in the school of the anatomist Heraclianus (xv, 136). This may have been only for the purpose of reducing expenses, but allows the possible intention of not returning. A dispute with his quarrelsome mother and a return home only after her death would aid in the explanation of the long sojourn. This presumption is somewhat supported by two facts; we hear nothing of her after his father's death and in his series of articles on ethics (xix, 45) he wrote one, unfortunately lost, on the Making of Wills.

Hermocrates, the Sophist of whom we spoke before, quarrelled with his mother so bitterly that she failed even to attend his funeral. In this case the quarrel was not over a will, but over her low passion for a slave, which gave him the right even to put her to death on account of the disgrace to the family.[59] This was also a cause of frequent estrangement in the second century.

Though Nikon's profession was architecture, he also owned a farm (vi, 755 *et seq.;* xiv, 22) which apparently added to his income. Galen describes it as back from the road on the left side between Pergamum and the seaport Elaea with a pretentious farm house facing south. Since he tells us of absences of his father on this farm, once for at least months, it would appear to have been some distance away, and hence it has been placed on our plan of Pergamum and Vicinity about ten miles out. It is evident from its situation that every trip to and from the farm carried the father and son past the beautiful and venerated shrine of Aesculapius, the activities of which in this their beloved city were a continued source of pride, interest and edification.

Needless to say we cannot help but wonder how much Nikon's devotion to agriculture was stimulated by the farm's freedom from Xanthippe. Ilberg[19] is even inclined to believe that the name Galen, which signifies serene, peaceful (the equivalent of Frederick in German), was bestowed by his father as an expression of his heart's desire for peace.

Yet Galen details so many experiments of his father in the rapid aging of wine (XIV, 17) and with the growth of almonds, peas, beans and lentils (VI, 552, 783) that it is difficult to doubt a real interest in scientific agriculture, in fact, they are sufficient in number to make it possible that it was from him Galen derived some of his lively spirit of investigation.

This farm with its slaves, its horses and its cows (V, 44), its vineyards and vegetable gardens and its hill of thyme harboring the bees whose honey he lauds so highly, apparently descended to the son by inheritance and remained one of the sources of his income since it appears to be still in his possession at the age of sixty-eight (XIV, 22). Though, as will be shown later, he almost surely lived in Rome from the age of thirty-nine onward except for one visit to Pergamum of which we know, and possibly one or two others unknown, the reciprocal regard between him and his native city was such that it is practically certain some of the investments left by his father were retained. It is even likely that these investments represented some which were not lost, since the Capital was full of schemes both legitimate and illegitimate for getting rich quickly and losing all with equal rapidity.

The farm furnished him as a boy opportunity to become interested in anatomy at the time of the slaughtering, and possibly as a physician a suitable place to carry out some of his extensive vivisection experiments on pigs and other animals.

Though Galen does not discourse particularly about his textbooks, we readily determine many from his references. The naming of them is interesting, particularly from the standpoint of comparison between textbooks then and now. At the present time they must be published within several years or they fail to contain the methods in vogue, then change was so slow that not only were the majority decades or even centuries old, but some of the most venerable were looked upon as the soundest in both theory and practice. In order to bring this out we have placed after the name of the author approximately the number of years before Galen's entrance into medicine in 147 A.D. that these textbooks were published.

Among them there was first and foremost Hippocrates (550 years), very likely in the recent edition (XV, 21, XVIII$_2$, 85) of Artemidorus Capito (twenty years), or that of his (Artemidorus') cousin Dioscorides (twenty years). He undoubtedly had other editions also like that of Rufus of Ephesus (forty years) with its commentaries.

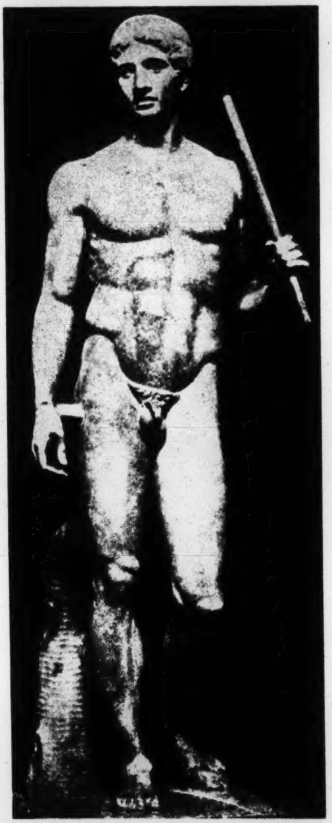

Fig. 8. Doryphorus, the Spear-bearer, the Model or Canon of Polyclitus, Showing the Human Male in Perfect Proportion. As an Anatomist and a Lover of Art, Galen Refers to It Several Times.

He studied the great Father of Medicine for physiology, fractures, dislocations, surgery, diagnosis, prognosis and treatment, both medical and dietary, and annotated the textbook with the explanations and interpretations of Satyrus and Stratonicus. He found it difficult to believe that his writings were not divinely inspired for he states (III, 21, 22) that though Hippocrates sometimes wrote obscurely, he never wrote anything which time has proved untrue.

There were also the works of Herophilus (440 years) and Erasistratus (430 years) on anatomy, physiology and therapeutics; Marinus' anatomy (twenty years) in four books, which he claims was the best textbook on the subject; Aristotle's works (480 years) and Plato's Timaeus and Philebus (500 years) for their physiology and general biology; Archigenes' pulse studies (forty years); Dioscorides' materia medica (ninety years); and Theon's exercise and massage (ten years). Absolutely current works were those of Pelops and Satyrus on Hippocrates and on anatomy.

From his love of literature, philosophy and medicine, and from his pride in his library, it is quite evident he was an avid collector of books. Everywhere we follow then we are to think of him in spare moments as a frequenter of bookshops, both as a critic of their wares and as a purchaser. This will be particularly true in Alexandria where they boasted of their meticulously perfect editions of the Greek classics, philosophy and medicine. On his travels no important library will be overlooked and no prominent philosophical or medical teacher remain unheard. For he assures us (II, 470) it was only some years later that he learned of Lycus' work on Anatomy, in fact only after the author was dead, or he would have gone out of his way to hear him.

His frequent mention of music and the importance he attached to it in general culture (III, 837) make it practically certain that he played on at least one, and possibly several musical instruments, the flute, lyre and cithara. This conclusion is further suggested by his comparison of the evening gathering of friends in his time with that of the ancients: "They come together now in the evening," he states (x, 3), "only to fill themselves with wine. No lyre, cithara or other musical instrument circulates from hand to hand which used to be considered a credit to play and a disgrace to be incapable of playing."

He expected his readers to attend the theaters (IV, 356), recommended them at times to patients (XI, 16), was himself a close student of the dramatists and compiled twelve books of dictionaries of words from Greek comedy (XIX, 48). Acquainted with and interested in the canon of Polyclitus (IV, 352, 355, 744; II, 545) and drawing illustrations as he does from the statues of Praxiteles, Phidias (II, 82; III, 238) and others (IV, 361, 606) we may take it that he missed little of importance in the art, musical and dramatic world. Like the majority of physicians, particularly investigators before and since, he took a negligible or no part in politics.

In accordance with the popular and medical theories of the time he was an advocate of exercise and the daily bath. The industrious rose at daybreak, spent an hour or so at study before a light breakfast, worked till the midday luncheon, took a siesta or read an hour, went to a public bath which was not unlike one of our athletic clubs where they exercised, bathed, rested awhile, and then proceeded to dinner with friends and co-workers. The meal was followed by discussion on interesting studies or the topics of the day.[60] Enjoying active exercise Galen usually took it in the form of wrestling. He was abstemious in eating and drinking, but as we shall see was a glutton for discussion.

The discourses of the rhetoricians, highly educated as they were in this age of their greatest popularity, teemed with references and allusions to the classics and with stories from past times. Philosopher that he was Galen scorned their principles yet unconsciously followed the literary fashion they created.[61] The same is even true of the Christian Fathers of the Second Century, Tatian, Theophilus, Athenagoras and Clement.[62]

As a consequence we find the Pergamite's writings replete with quotations from Homer, Hesiod and literary men in general and with stories from history, mythology and the dramatists. Judging his conversation to be similar, it was undoubtedly lively, and though we have no reason to believe he was addicted to the ribald, when the opportune occasion arose he was equal to upholding his part.

It is to be recalled that Ancient Comedy exercised itself principally on sex, and though the humor of the Court of Marcus Aurelius was probably somewhat austere, the spirit of the populace differed little from the time of Aristophanes. This is evidenced by what we know of their favorite pantomimes representing, as they usually did, indecorous tales of the gods, goddesses and mythological heroes, and from what they considered laughable episodes in Lucius Apuleius' contemporaneous novel "The Golden Ass."

One of many humorous flashes from Galen's pen, some of which cannot be repeated (VIII, 419) relates to the deformed husband who desiring to procreate a beautiful boy had a portrait of Cupid painted on the bedroom wall for his wife to gaze on and think about during intercourse (XIV, 253).

Galen was an only child and never married, thus preserving the opportunity to pursue his career without domestic infringements on time.[63] His failure to wed was probably due partly to the strife he witnessed in early life and partly to the fact that until advanced in years he never remained long enough in one place for propinquity to exercise its effect. Philosophical reflection may also have influenced since he quotes (XI, 586) with sympathy the erotic poet:—that love is like wormwood mixed with exquisite honey, bittersweet. This description, however, makes it appear that he was not entirely without experience.

REFERENCES TO PART I

1. The references in parentheses indicate the volume and page of the Kuhn Edition, Claudii Galeni Opera Omnia, Leipzig, 1821, the most recent, widespread and handiest edition of his works. It is in 22 octavo volumes, each page giving the original Greek and a Latin translation. Unfortunately it contains numerous typographical errors necessitating comparison with other editions.

The other so-called complete editions are:

Editio princeps-Aldina Venetiis (Greek), 1525, 5 vols., folio.

Editio Basiliensis (Greek and Latin, in separate volumes), Basileae, 1538, 5 vols., folio.

Editio Charteriana (Greek and Latin), edited by Renatus Charterius, Paris, 1638–1679, 13 vols.

Editio Juntina (Latin), Venet., 1586, 7 vols.

There are also a number of publications containing one or several of his works, for instance, the edition of his lesser writings in the original Greek by Marquardt, Müller and Helmreich (Claudii Galeni Pergameni: Scripta Minora, Leipzig, Tuebner, 1884–1893), and the even more important edition of the last seven books of his great Manual of Dissection (Anatomicae Administrationes) in Arabic and German by Max Simon (Sieben Bucher Anatomie des Galen, 2 vols., Leipzig, J. C. Hinrichs, 1906).

A small number of his works have been translated into modern languages, the largest collection being that of Charles Daremberg into French (Oeuvres Anatomiques Physiologiques et Medicales de Galien, 2 vols., Paris, Baillière, 1854). This contains his important treatises on physiology and pathology, the former called the Use or Utility of the Parts, the latter, the Places Affected. Finally, considerable of the work on Method of Cure which was the great textbook on treatment for the next fourteen centuries has been translated into German and English, the former translation by students in inaugural dissertations under the direction of Professor Pagel and more recently Professor Sudhoff; the latter by Thomas Gale in 1586. The German parts are by: Heinrich Brink, Kuhn Edition, Vol. x, pp. 1–45; Cornelius ter Beek, 45–77; Friedrich Meyer, 78–104; Kurt Wandersleben, 104–126; Johannes Carney, 157–186; Emil Schröder, 186–196; Fritz Prusmann, 186–204; Ernst Glaser, 232–249; Max Voigt, 530–570; Arthur Beck, 570–598; Julius Tietz, 945–971; Josef Szczepanski, 971–1021. The Gale translation into English is from page 157 to 455. There is also a much abridged translation into English by Peter English 1656 of the entire work. Attention will be called to all modern translations in the description of the individual writings.

2. This means about four volumes the size of Osler's Principles and Practice which contains 600,000 words.
3. ILBERG, J. Ueber die Schriftstellerei der Klaudios Galenos. *Rheinisch. Museum f. Philol.*, 44: 207, 1889; 47: 489, 1892; 51: 165, 1896; 52: 591, 1897. Credit, however, must also be given to Ackermann's Historia Literaria Claudii Galeni in the first volume of the Kuhn edition.

4. Walsh, J. Refutation of Ilberg as to the date of Galen's birth. Ann. Med. Hist., n. s. 4: 126–146, 1932.
5. Even his grandfather and greatgrandfather were educated men (xix, 40).
6. For further description of his native city see: (*a*) Prendergast, J. S. The background of Galen's life and activities and its influence on his achievements. *Proc. Roy. Soc. Med.*, 23: 1131–1148 (June) 1930; (*b*) Walsh, J. Galen's discovery and promulgation of the function of the recurrent laryngeal nerve. (With illustrations.) Ann. Med. Hist., 8: 176–184, 1926.
7. Some of these are Homer, Aesop, Sappho, Pythagoras, Thales, Anaxagoras, Diogenes, Epictetus, Polemon,* Aristides,* Aristocles,* Apollonius of Perga, Herodotus, Cassius Dio,* Pausanias,* Strabo, Hippocrates, Praxagoras, Herophilus, Erasistratus, Asclepiades, Thessalus, Dioscorides, Rufus of Ephesus, Soranus of Ephesus and Aretaeus. The ones marked with an asterisk were contemporaneous with Galen.
8. Other well-known shrines were in Tricca, Epidaurus, Athens, Cos, Smyrna, Aegae, Abonouteichos, Cyrene, Lebene (Crete) and Rome.
9. The Correspondence of Marcus Cornelius Fronto with Marcus Aurelius, translated by C. R. Haines. N. Y., Putnam, 1919, 1: 51.
10. Friedländer, L. Roman Life and Manners under the Early Empire. Trans. by J. H. Freese, and Leonard A. Magnus. London, Routledge, n. d., 2: 325.
11. Wiegand, T. Zweiter Bericht uber die Ausgrabungen in Pergamon 1928–32: Das Asklepieion. *Aus den Abbandl. d. Preuss. Akad. d. Wissenscb. Pbil. Hist. Klasse*, Nr. 5, Berlin, 1932.
12. See also Caton, R. Temples and ritual of Aesculapius at Epidaurus and Athens 1900; and The temples, hospital and medical school of Cos. 17th Internat. Congr. Med., London, 1913, Sect. 23, Hist. of Med., p. 19.
13. Neither Galen in his references to the shrine nor Wiegand in his report mentions the sacred serpents, though we have reason to believe they were employed. Considered to be an incarnation of Aesculapius they were trained to act as acolytes. A harmless variety easily tamed they were coached to accept gratefully the gifts of popana cakes and to perform various offices like stroking with the tongue external wounds of patients. They were probably made more use of in fraudulent shrines of Aesculapius, such as that of Abonouteichos run by the charlatan prophet Alexander who played the rich Roman Senator Rutilianus for a dupe for a number of years and during the great pest actually influenced many in the Capital, even Marcus Aurelius. For the entertaining story of Alexander and his activities, which corresponds in numerous details with the scientific investigation of spiritualists today, see The Works of Lucian of Samosata, trans. by W. H. and F. G. Fowler. Oxford, Clarendon Press, 1905, 2: 212.
14. Wiegand. *Op. cit.*, p. 31.
15. Dio's Roman History. Trans. by Earnest Cary. N. Y., Putnam, 1927, 9: 317–323.
16. Philostratus and Eunapius. The Lives of the Sophists. Trans. by Wilmer Cave Wright. N. Y., Putnam, 1922, p. 271, where an interesting and diverting account is given of this typical precocious second century youth.
17. Galen wrote this work first in 175, but he re-edited it in 196, and it is this second edition we possess. Hermocrates died about 200.
18. Friedländer. *Op. cit.*, 3: 138.
19. Ilberg, J. Aus Galens Praxis. *Neue Jabrb. f. d. Klass. Altertum Gesch. u. Deutsche Lit.*, Leipzig, 15: 276–312, 1905.
20. Philostratus and Eunapius. *Op. cit.*, p. 187.
21. Bussemaker and Daremberg. Oeuvres d'Oribase. Paris, 1854, 2: 51.
22. Friedländer. *Op. cit.*, 3: 135.
23. From this and a similar remark (iii, 182) on the habit of sitting down "with the book extended on his thigh" it would appear this was the fashion in which he did his writing. Daremberg (*op. cit.*, 1: 220) also calls attention to this.
24. These two Greek words are commonly taken to mean rage and anger. Since the former includes the latter it is scarcely likely this is what Galen intended, and since either one may be taken to signify lust, this significance has been adopted. In addition he speaks

later (v, 27) of erotism (ἔρωτα) so that we know he meant to include it.

25. van der Elst, R. Traité des passions d l'âme et de ses erreurs. Paris, Delagrave.
26. See also Chartier, Galeni Vita. Galeni Opera. Paris, 1679, 1: 93.
27. According to Dörpfeld (*Athen. Mitt. d. Instit.* 1902, p. 29 *f*, quoted in Altertümer von Pergamon, Berlin, 1913, Bd. 1, Text 2, p. 286) Nikon was probably the designer of a massively built, handsome addition to the Market House on the Acropolis, the foundations of which still exist. It was beautifully decorated and was apparently used as a directors' meeting room. Dezeimeris (Dictionaire Historique) states he held the local official position of senator. Schöne (Galeniana Schedae Philogae, Bonn, 1891) is inclined to think that Nikon is a short form of Nicodemus and that his name was Julius Nicodemus. He even mentions the tablet of a possible relation, Aelius Nikon.
28. Sprengel, K. Histoire de la médecine. Paris, 1815, 1: 380.
29. van der Elst. *Op. cit.*, Note 45, p. 102.
30. Ordinarily spoken of as "of Arles" in France, but his last years, those during Galen's student life, were spent in Rome.
31. Philostratus and Eunapius. *Op. cit.*, p. 183.
32. Herodes Atticus taught Marcus Aurelius in Rome about 140, about 142 he married the Roman heiress Annia Regilla, in 143 he was consul, and in 148 he became Proconsul of Greece. If Aristocles was Galen's teacher of philosophy, this would necessitate his coming under the influence of Herodes Atticus not earlier than 146, while it is more likely, aristocrat that he was, that he attended his course about 140 at the same time as Marcus Aurelius. When Herodes and his pupils visited Pergamum is unknown. A likely time is in 163 during the Parthian War, when his previous pupil, the co-emperor Lucius Verus, married Lucilla in Ephesus, eighty-five miles away, Herodes almost surely attending the ceremony. Galen was at this time in Rome.
33. Each book was in the form of a roll and Galen's contained on an average about 11,000 words. For the sake of comparison this chapter contains 14,073 words. When he speaks of a small book it means under 6000 and a very small book under 3000 words; for instance, his first article on medicine (ii, 887–908) is described by the last term and consists of 2800 words.
34. Ilberg, J. *Op. cit.*, Rheinisches Museum, 52.
35. This uprising under the fanatical Bar-Cocheba took place in 132 and the Roman conquest was complete by 135. On the site of Jerusalem was established a new city called Aelia Capitolina in which Jews were prohibited on pain of death (Schürer, E. History of the Jewish People. Edinburgh, Clark, 1890, Div. 1, 2, p. 289 *et seq.*).
36. The various texts make Galen call him Costunius Rufinus without known reason. Consul with him in Rome was Quadratus, a member of Pergamum's best known and most illustrious family, his grandfather having been a general and a consul under Trajan. Rufinus' coming to Pergamum may have been partly on the invitation of this rich distinguished citizen. One of Quadratus' descendants was named Apellas (Weber, W. in Wiegand's Zweiter Bericht, *Op. cit.*, p. 64) who may be identical with a physician of the same name in Rome, an admirer of Galen (viii, 362).
37. The majority of writers call it Methodism. The term Methodology is employed to avoid confusion with the modern religious sect.
38. For an extended description of these sects see: Walsh, J. Galen clashes with the medical sects at Rome. *Med. Life*, 35: 408–443, 1928. Or Neuburger, M. History of Medicine. Vol. 1. Trans. by Ernest Playfair. London, 1910.
39. Walsh, J. Galen's second sojourn in Italy and his treatment of the family of Marcus Aurelius. *Med. Life*, 37: 473–505, 1930.
40. Simon, M. Sieben Bucher Anatomie des Galen. Leipsic, Hinrichs, 1906, 2: 167.
41. Spelt in another place Phicianus (xvii$_1$, 575) and again Ficianus (xvi, 484).

42. Sprengel, K. *Op. cit.*, 1: 375.
43. This is particularly evident in his work on anomalous dyscrasias or inequality of temperaments (vii, 733–752) as was pointed out by Wellmann (Ilberg. *Op. cit.*, Rheinisches Museum 51).
44. Commonly used was the macacus inuus or Barbary ape, whose hand very closely resembles that of man. For an excellent comparative illustration see: Singer, C. The Evolution of Anatomy. N. Y., Knopf, 1925, pp. 54 and 55. This is also the animal on which Klebs made the first successful inoculation of syphilis (Klebs, E. Das contagiums der Syphilis. *Arch. f. exper. Pathol. u. Pharmakol.*, 10: 161, 1879).
45. Walsh, J. Galen's studies at the Alexandrian school. Ann. Med. Hist., s. 1, 9: 132–143, 1927.
46. Their knowledge of the function of the kidney and bladder is shown in Galen's Treatise on the Natural Faculties recently translated into English by A. J. Brock, N. Y., Putnam, 1916, p. 50.
47. Walsh, J. Galen's treatment of pulmonary tuberculosis. *Am. Rev. Tuberc.*, 24: 1–41, 1931.
48. The Genuine Works of Hippocrates. Trans. by Francis Adams. London, Sydenham Soc., 1849, 1: 353.
49. This resume of what he was taught in the way of examination of a case and the diseases he encountered has been taken from many of Galen's works, but particularly three. Two of these, namely, Places Affected (viii, 1–452) and Therapeutics to Glaucon (xi, 1–146) may be read in modern French in the translation of Charles Daremberg. The third, namely, Method of Cure (x, 1–1021) may be read in its important parts in modern German and in old English (see Ref. 1). In fact the majority of these conditions are described in the works of Hippocrates[48] on practically all of which Galen wrote commentaries.
50. Ilberg (*Op. cit.*, Rheinisches Museum, 47, p. 489) translates this "to a young man with eye disease" (einem augenkranken jungen Manne gewidmete). The justifiability of this translation is doubtful, and the fact that the work was on diagnosis instead of treatment makes it more likely it was for a confrere than for a layman.
51. Hurd-Mead, K. C. An introduction to the history of women in medicine. Ann. Med. Hist., n. s., 5: 171, 1933.
52. Apparently between September 149 and the Spring of 150, because as we shall see later Galen was ill during the dog days of 150, and this illness occurred some time after his father's death. Nikon's epitaph has possibly been preserved in Die Inschriften von Pergamon (ii, 370 Nr. 587); here also are two inscriptions supposed to be from his pen (ii, 244 *ff.* Nr. 333).
53. His contemporary, the eminent satirist Lucian who was five years his senior, was not so fortunate since shortly after the age of sixty he found himself sufficiently destitute that he was obliged to move from his beloved Athens to Alexandria and take a government position, much to his mortification and chagrin.
54. See for instance Philostratus and Eunapius, *op. cit.*, p. 223, on the extravagance of the rhetoricians, among others Galen's friend Adrian, who held the important chair of sophistry at Athens, considered to be the highest professorship in the Empire.
55. The Correspondence of Marcus Cornelius Fronto, *Op. cit.*, 1: 22, 146.
56. Marci Antonini quos ipse sibi scripsit Libri Duodecim, Joannes Matthias Schultz, Slesvici Sumtibus Joannis Gottlobii, Roehss 1802, pp. 136, 138.
57. The virtues recommended by Socrates according to Xenophon's Memorabilia and called cardinal in modern catechisms.
58. My first rendition was "snapping at her maids," but further reading shows that actual biting was sufficiently common to make this more likely. He uses the same verb (*δάκνειν*) in his description of a man in rage biting a key when it failed to open the door immediately (v, 16). Remarkable to relate, the sane and intellectual Lucian became so enraged at the charlatan prophet Alexander that he inflicted a severe bite (*δῆγμα*, from the verb *δάκνειν*) on the hand extended to him to kiss (Benedictus, J. Luciani Samosatensis Opera. Amstelodami, 1687, 1: 779).

59. PHILOSTRATUS and EUNAPIUS. *Op. cit.*, p. 273.
60. For the meals and the exact division of day see article under Reference 47.
61. For example see Galen's Exhortation to the Study of the Arts especially Medicine translated into English by Joseph Walsh, *Med. Life*, 37: 506–529, 1930.
62. The Ante-Nicene Fathers. Ed. by Rev. Alexander Roberts, and James Donaldson, Buffalo, Christian Lit. Pub., 1885.
63. Among other historical bachelors are: Plato, Virgil, Horace, Epictetus, Descartes, Spinoza, Kant, Hume, Schopenhauer, Herbert Spencer, Nietzsche, Gibbon, Macaulay, Copernicus, Galileo, Newton, Leonardo da Vinci, Michelangelo and Humboldt.

[Part II will appear in the March issue.]

WITHERING ON DIGITALIS, 1785

By W. T. DAWSON, M.A. (OXON.) AND JOHN CHAPMAN, M.D.

GALVESTON, TEXAS OSAWATOMIE, KANSAS

An excellent account of the life and work of William Withering has been given by Cushny,[1] who said of one of his paragraphs (1), "Withering sums up in this paragraph the main principles of digitalis treatment."

Withering's great monograph "On the Foxglove,"[2] published in 1785, should be available to every student, but this classic work is a rare and costly curiosity among medical books, as no English reprint seems to have been made. The intention of the present writers is simply to set forth interesting parts of Withering's account of experiences with digitalis, in his own words.

It is better the world should derive some instruction, however imperfect, from my experience, than that the lives of men should be hazarded by its unguarded exhibition, or that a medicine of so much efficacy should be condemned and rejected as dangerous and unmanageable. . . .

Time will fix the real value upon this discovery, and determine whether I have imposed upon myself and others, or contributed to the benefit of science or mankind. . . .

In the year 1775, my opinion was asked concerning a family receipt for the cure of the dropsy. . . . This medicine was composed of twenty or more different herbs; but it was not difficult for one conversant in these subjects, to perceive that the active herb could be no other than the Foxglove.

EFFECTS, RULES, AND CAUTIONS

The Foxglove when given in very large and quickly repeated doses, occasions sickness, vomiting, purging, giddiness, confused vision, objects appearing green or yellow; increased secretion of urine, with frequent motions to part with it, and sometimes inability to retain it; slow pulse, even as slow as 35 in a minute, cold sweats, convulsions, syncope, death.

I am doubtful whether it does not sometimes excite a copious flow of saliva [citing 3 cases, of the last of which] the superabundant flow of urine continued for the first three days after his last course; but since, the flow of saliva has been nearly equal to that of urine.

When given in a less violent manner, it produces most of these effects in a lower degree; and it is curious to observe that the sickness, with a certain dose of the medicine, does not take place for many hours after its exhibition has been discontinued; that the flow of urine will often precede, sometimes accompany, frequently follow the sickness at the distance of some days, and not unfrequently be checked by it. The sickness thus excited, is extremely different from that occasioned by any other medicine; it is peculiarly distressing to the patient; it ceases, it recurs again as violent as before; and thus it will continue to recur for three or four days, at distant and more distant intervals.

These sufferings of the patient are generally rewarded by a return of appetite, much greater than what existed before the taking of the medicine.

But these sufferings are not at all necessary; they are the effects of our inexperience, and would in similar circumstances, more or less attend the exhibition of almost every active and powerful medicine we use.

Perhaps the reader will better understand how it ought to be given, from the following detail of my own improvement, than from precepts peremptorily delivered, and their source veiled in obscurity.

At first I thought it necessary *to bring on and continue the sickness, in order to ensure the diuretic effects.*

I soon learnt that the nausea being once excited, it was unnecessary to repeat the medicine, as it was certain to recur frequently, at intervals more or less distant.

Therefore my patients were ordered *to persist until the nausea came on and then to stop.* But it soon appeared that the diuretic effects would often take place first, and sometimes be checked when the sickness or a purging supervened.

The direction was therefore enlarged thus—*Continue the medicine until the urine flows, or sickness or purging takes place.*

I found myself safe under this regulation for two or three years; but at length cases occurred in which the pulse would be retarded to an alarming degree, without any other preceding effect.

The directions therefore required an additional attention to the state of the pulse, and it was moreover of consequence not to repeat the doses too quickly, but to allow sufficient time for the effects of each to take place, as it was found very possible to pour in an injurious quantity of the medicine, before any of the signals for forbearance appeared.

**Let the medicine therefore be given in the doses and at the intervals mentioned above:—Let it be continued until it acts either on the kidneys, the stomach, the pulse, or the bowels; let it be stopped upon the first appearance of any one of these effects,* and I will maintain that the patient will not suffer from its exhibition, nor the practitioner be disappointed in any reasonable expectation. [Only the continuance with small maintenance dosage is omitted.]

If it purges, it seldom succeeds well.

The patients should be enjoined to drink very freely during its operation. I mean, they should drink whatever they prefer, and in as great quantity as their appetite for drink demands. This direction is the more necessary, as they are very generally prepossessed with an idea of drying up a dropsy, by abstinence from liquids, and fear to add to the disease, by indulging their inclination to drink.

In cases of ascites and anasarca; when the patients are weak, and the evacuation of the water rapid; the use of a proper bandage is indispensably necessary to their safety.

If the water should not be wholly evacuated, it is best to allow an interval of several days before the medicine be repeated, that food and tonics may be administered; but truth compels me to say, that the usual tonic medicines have in these cases very often deceived my expectations.

From some cases which have occurred in the course of the present year, I am disposed to believe that the Digitalis may be given in small doses, viz., two or three grains a day, so as gradually to remove a dropsy, without any other than mild diuretic effects, and without any interruption to its use until the cure be compleated.

If inadvertently the doses of the Foxglove should be prescribed too largely, exhibited too rapidly, or urged to too great length; the knowledge of a remedy to counteract its effects would be a desirable thing. Such a remedy may perhaps in time be discovered. . . .

Withering recognized the action of digitalis upon the heart in his statement, "that it has a power over the motion of the heart, to a degree yet unobserved in any other medicine, and that this power may be converted to salutary ends," and in the remark already quoted that the pulse might be "retarded to an alarming degree, without any other preceding effect."

Withering described a type of congestive heart failure responding well to digitalis:

> If the pulse be feeble or intermitting, the countenance pale, the lips livid, the skin cold, the swollen belly soft and fluctuating, or the anasarcous limbs readily pitting under the pressure of the finger, we may expect the diuretic effects to follow in a kindly manner.

His case reports are short and to the point.

> 1775. Case I. December 8th. A man about fifty years of age, who had formerly been a builder, but was now much reduced in his circumstances, complained to me of an asthma which first attacked him about the latter end of autumn. His breath was very short, his countenance was sunken, his belly large; and, upon examination, a fluctuation in it was very perceptible. His urine for some time past had been small in quantity. I directed a decoction of Fol. Digital. recent. which made him very sick, the sickness recurring at intervals for several days, during which time he made a large quantity of water. His breath gradually drew easier, his belly subsided and in about ten days he began to eat with a keen appetite. He afterwards took steel and bitters.
>
> 1784. Case CXXXII. July 16th. Mr. B———, of W———, Æt. 31. After a tertian ague of 12 months continuation, suffered great indisposition for 10 months more. He chiefly complained of great straitness and pain in the hypochondriac region, very short breath, swelled legs, want of appetite. He had been under the care of some very sensible practitioners, but his complaints increased, and he determined to come to Birmingham. I found him supported upright in his chair, by pillows, every attempt to lean back or stoop forward giving him the sensation of instantaneous suffocation. He said he had not been in bed for many weeks. His countenance was sunk and pale; his lips livid; his belly, thighs, and legs very greatly swollen; hands and feet cold, the nails almost black, pulse 160 tremulous beats in a minute, but the pulsation in the carolid [*sic*] arteries was such as to be visible to the eye, and to shake his head so that he could not hold it still. His thirst was very great, his urine small in quantity, and he was disposed to purge. I immediately ordered a spoonful of the infusum Digitalis every six hours, with a small quantity of *laudanum*, to prevent its running off by stool, and decoction of leontodon taraxacum (dandelion) to allay his thirst. The next day he began to make water freely, and could allow of being put into bed, but was raised high with pillows. Omit the infusion. That night he parted with six quarts of water, and the next night could lie down and slept comfortably. *July* 21st, he took a mild mercurial bolus. On the 25th, the diuretic effects of the digitalis having nearly ceased, he was ordered to take three grains of the pulv. Digital. night and morning, for five days, and a draught with half an ounce of vin. chalyb. twice a day. *August* 15th. He took a purge of calomel and jallap, and some swelling still remaining in his legs, the Digitalis infusion was repeated. The water having been thus entirely evacuated, he was ordered saline draughts with acetum scilliticum (vinegar of squill) and pills of salt of steel and extract of gentian. About a month after this, he returned home perfectly well.

Withering also had to deal with the self-prescribing patient. Case CVI (1782) is that of a disobedient patient, who continued to take digitalis against directions; he suffered "many days" from "reaching," green vision, and pulse rate of "down to forty," with great weakness.

His friend, Dr. Stokes of Stourbridge, described death from overdose of digitalis at the Edinburgh Infirmary in 1780:

> In one case in which it was given properly at first, the urine began to flow freely on the second day. On the third the swellings began to subside. The dose was then increased more than *quadruple* in the twenty-four hours. On the fifth day, sickness came on, and much purging, but the urine still increased though the pulse sunk to 50. On the 7th day, a *quadruple* dose of the infusion was ordered to be taken every third hour, so as to bring on nausea again. The pulse fell to forty-four, and at length to thirty-five in a minute. The patient gradually sunk and died on the sixteenth day; but previous to her death, for two or three days, her pulse rose to near one hundred.

It is not easy for most men to learn how to give digitalis properly. Withering commented that a remedy "will ever be subject to the whims, the inaccuracies and the blunders of mankind," and

> . . . in the year 1783, it [i.e., digitalis] appeared in the new edition of the Edinburgh Pharmacopoeia. But from which, I am satisfied, it will be again very soon rejected, if it should continue to be exhibited in the unrestrained manner in which it has heretofore been used at Edinburgh, and in the enormous doses in which it is now directed in London.

Withering attempted to secure a standard preparation by taking only leaves gathered when the plant was in flower, and drying them carefully. At first he used a decoction, later an infusion, and in the end powdered leaf or infusion. He was annoyed by the needless multiplicity of drug preparations, for he says:

> The ingenuity of man has ever been fond of exerting itself to vary the forms and combinations of medicines. Hence we have spirituous, vinous and acetous tinctures; extracts hard and soft, syrups with sugar or honey, &c but the more we multiply the forms of any medicine, the longer we shall be in ascertaining its real dose.

Withering left some suggestions as to dosage. "I give to adults, from one to three grains of this powder twice a day." "About thirty grains of the powder . . . may generally be taken before the nausea commences." This is close to the average massive dose figure sometimes used today. Withering himself also sometimes carried out rapid digitalization, as in the following case.

> Case XLIII, 1780. I then directed Pulv. Fol. Digital. two grains every four hours. After taking eighteen grains, the urine began to increase. The medicine was then stopped. The discharge of urine continued to increase. . . .

With regard to redigitalization Withering says:

> I have often been obliged to evacuate the water repeatedly in the same patient, by repeating the decoction. . . . In these cases the decoction becomes at length so very disagreeable, that a much smaller quantity will produce the effect.

References

1. Cushny, A. R. William Withering, M.D., F.R.S. *Proc. Roy. Soc. Med.*, 8 (Sect. on Hist. of Med.): 85, 1915. The paragraph referred to by Cushny is that indicated by an asterisk on page 32.
2. Withering, William, M.D., Physician to the General Hospital at Birmingham. An Account of the Foxglove and Some of Its Medical Uses: with Practical Remarks on Dropsy, and Other Diseases. Birmingham: Printed by M. Swinney; for G. Ç. J. and J. Robinson, Paternoster-Row, London, M, DCC, LXXXV.

RABANUS MAURUS: "DE SERMONUM PROPRIETATE, SEU DE UNIVERSO"*

By EVERETT COLGATE JESSUP, M.D.

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THE contemplation of the unique has always had a peculiar fascination for the human mind. Standing before the barker at the side show we are enthralled as he declaims: "JoJo—the dog-faced boy. There are only two, we have one, the other is dead." The object of our interest may have little economic, esthetic, utilitarian or sentimental value, only uniqueness. Whether this paper is much different in essentials from the side show is a question. It may have some of the latter's interest.

Incunabula is a Latin word meaning "swaddling clothes" or cradle and has been specialized to denote books printed up to and including the year 1500. These books, which represent the transition from manuscript writing to stereotyped printing and mass production, were produced during the latter half of the fifteenth century.

It has been estimated (Proctor) that about 20,000,000 of these books were printed, of which the vast majority have since disappeared. The total number at present is probably between two or three hundred thousands, at least half of which are in Germany. In 1919 there were 13,000 in the United States and at present there are 125 in the Library of the New York Academy of Medicine. Almost 40,000 titles have been indexed of which 3000 may be classed as Incunabula Medica. Assuming the same ratio of complete editions it would mean 15,000–20,000 medical incunabula in existence of which this book, "De Sermonum Proprietate, seu de Universo," by Rabanus Maurus (1467) is the first, the "Speculum of Roderecus Zamorensis" (1468) the second and the "Historia naturalis" of Pliny (1469) the third (Osler classification).

The interest in these old books has seldom flagged since the first printed catalogue of them by Cornelius Van Beughem in 1688; the passion for collecting them was never greater than during the present century. With the available supply constantly growing less and the demand increasing the value of these books has enhanced enormously. This situation has been created not so much by the ever eager American millionaire adding to his collection, but by the cloistered gentlemen who have little money at all but possess a great passion for books, the university librarians. Can you imagine the thrill that comes to a man who spends his time cataloguing books, wading daily through the mass of riff-raff that the printing presses pile upon his desk, when suddenly his hand falls upon an ancient tome bound in hand-tooled leather, ornamented with raised brass corners and clasps and scarred by the wear and tear of almost 500 years—printed indeed before the discovery of America—one of the first of all the thousands that line the shelves above his head? There are over six hundred colleges in the United States alone and only 150 of them have incunabula (1925) and each college has a library and a librarian and each librarian is convinced that a library is no library at all unless it can trot out a few incunabula. When the incunabulum lands in a library it is usually there forever, to be dislodged only by some great crisis in human affairs.

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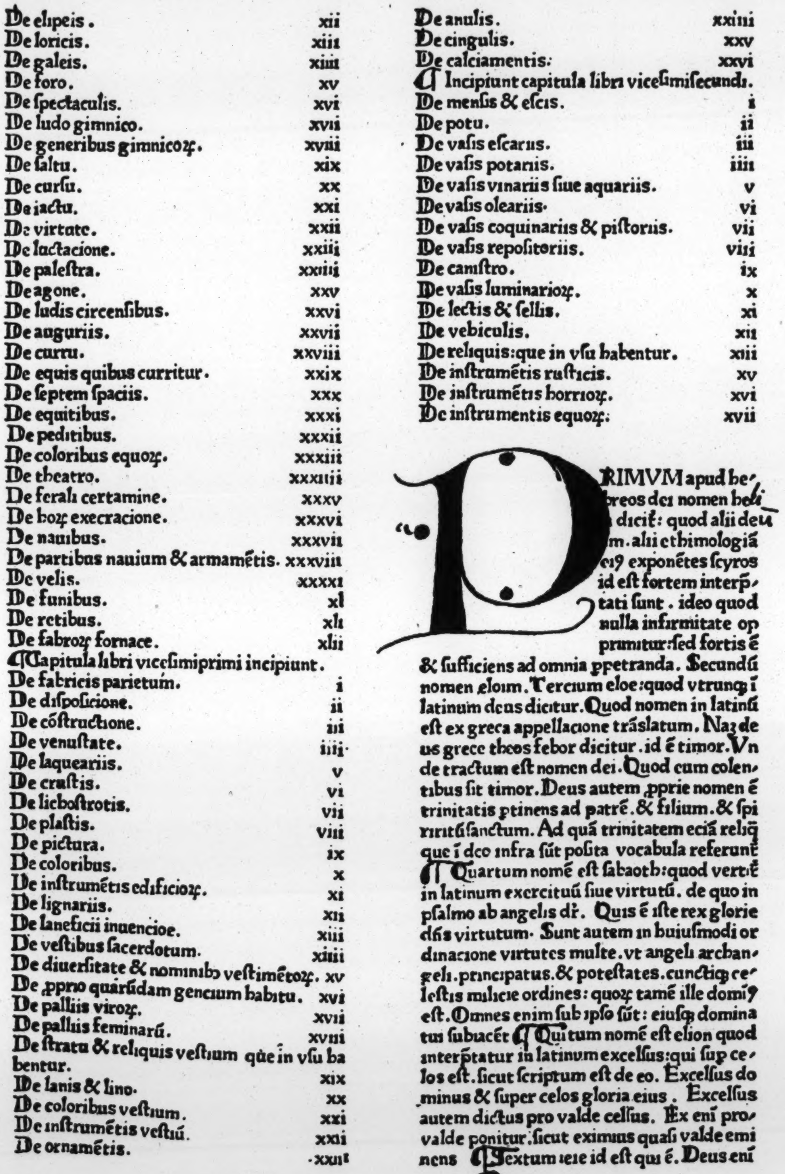
* Read before the Section of Historical and Cultural Medicine, N. Y. Academy of Medicine, May 13, 1932.



De clipeis.	xii
De loricis.	xiii
De galeis.	xiiii
De foro.	xv
De ſpectaculis.	xvi
De ludo gimnico.	xvii
De generibus gimnicoꝝ.	xviii
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De licboſtrotis.	vii
De plaſtis.	viii
De pictura.	ix
De coloribus.	x
De inſtrumẽtis edificioꝝ.	xi
De lignariis.	xii
De lanificii inuencioe.	xiii
De veſtibus ſacerdotum.	xiiii
De diuerſitate & nominibꝫ veſtimẽtoꝝ.	xv
De ꝓprio quarũdam gencium habitu.	xvi
De palliis viroꝝ.	xvii
De palliis feminarũ.	xviii
De ſtratu & reliquis veſtium que in vſu habentur.	xix
De lanis & lino.	xx
De coloribus veſtium.	xxi
De inſtrumẽtis veſtiũ.	xxii
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De cingulis.	xxv
De calciamentis.	xxvi
Incipiunt capitula libri viceſimiſecundi.	
De menſis & eſcis.	i
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De vaſis eſcariis.	iii
De vaſis potariis.	iiii
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De vaſis oleariis.	vi
De vaſis coquinariis & piſtoriis.	vii
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De lectis & ſellis.	xi
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De reliquis: que in vſu habentur.	xiii
De inſtrumẽtis ruſticis.	xv
De inſtrumẽtis horrioꝝ.	xvi
De inſtrumentis equoꝝ.	xvii

PRIMVM apud hebreos dei nomen heli dicit: quod alii deum. alii ethimologiã eius exponẽtes ſcyros id eſt fortem interꝓtati ſunt. ideo quod nulla infirmitate opprimitur: ſed fortis ẽ & ſufficiens ad omnia ꝑpetranda. Secundũ nomen eloim. Tercium eloe: quod vtrunqꝫ ĩ latinum deus dicitur. Quod nomen in latinũ eſt ex greca appellacione trãſlatum. Naꝫ deus grece theos febor dicitur. id ẽ timor. Vnde tractum eſt nomen dei. Quod cum colentibus ſit timor. Deus autem ꝓprie nomen ẽ trinitatis ꝑtinens ad patrẽ. & filium. & ſpiritũ ſanctum. Ad quã trinitatem eciã reliqua que ĩ deo infra ſũt poſita vocabula referunt. Quartum nomẽ eſt ſabaoth: quod vertitur in latinum exercituũ ſiue virtutũ. de quo in pſalmo ab angelis dr. Quis ẽ iſte rex glorie dñs virtutum. Sunt autem in huiuſmodi ordinacione virtutes multe. vt angeli archangeli. principatus. & poteſtates. cunctiqꝫ celeſtis milicie ordines: quoꝝ tamẽ ille dominus eſt. Omnes enim ſub ipſo ſũt: eiuſqꝫ dominatui ſubiacẽt. Quintum nomẽ eſt elion quod interꝑtatur in latinum excelſus: qui ſup celos eſt. ſicut ſcriptum eſt de eo. Excelſus dominus & ſuper celos gloria eius. Excelſus autem dictus pro valde celſus. Ex enĩ pro valde ponitur. ſicut eximius quaſi valde eminens. Sextum eie id eſt qui ẽ. Deus enĩ

FIG. 1. PAGE FROM THE FIRST MEDICAL INCUNABULUM: RABANUS MAURUS' "DR SERMONUM PROPRIETATE."

Considering all the foregoing as the introduction to this paper one is a bit uncertain as to the manner of handling the main theme. If this audience were a gathering of bibliographers one would immediately plunge into Hain, Copinger, Proctor, Osler numerals with collations, signatures, foliations and catchwords, with lines and columns to the page, the format, etc., a descriptive analysis that resembles the classification of an insect. The collations, number of leaves to the quire, would sound like a set of football signals, a.8, b.10, c.10, d.9, etc.

Suffice it to say along this line that being one of the earliest incunabula resembling the manuscript rather than the later printed book, this book has no title page (first used 1471), no numbered pages or head lines (first used 1470), no signatures, catchwords or colophon (the latter a printer's device at the end of a book). It is not dated, but a copy in the Bibliothèque Nationale in Paris is inscribed with the original date of purchase July 20, 1467. It has lost its original binding and is encased in a sixteenth century binding of paper boards, calf back, folio size, with two ancient vellum manuscript sheets pasted on the inside, a strange but frequent fate of ancient manuscripts in the sixteenth century. It has initials, paragraph marks and initial strokes painted in red by hand. The first initial space is empty. It is a bit fascinating to speculate on the reason. Was it intended to have an elaborate first initial and the hand that painted the plain red initials was not equal to the task? Or if only one rubricator was expected to do the whole job he may have decided to do a large initial in several colors last and the book was required before he had finished; or possibly the rubricator did not trouble to put in the first initial as it came in the preliminary matter and not in the text. Such are the thoughts of a bibliographer.

If this were a gathering of typographers a discussion of the art of printing these early books would be in order and this book would serve as an excellent text as it is printed from the very first Roman type ever cast, known as the R-type from its peculiar capital R. All other types used up to this time were Gothic. How many copies of this book were printed is unknown but as the early type used was quite soft, probably not more than three hundred. How many are now left? Very few. "This is one, most of the others are dead." At the regular mortality rate there would be four left. I know there are more. We will know for certain around the year 1955 when the Gesamt catolog of the Prussian Commission is completed. The printer was Adolf Rusch of Strassburg who with this type printed one of the earliest editions of the Bible about 1469. He married Salome, daughter of Mentelin, the first printer of Strassburg, and seems to have worked both on his own account and for his father-in-law. He published mostly monumental works of the classics, of medicine and of theology, all anonymously.

In addressing a medical group there is a strong temptation to dwell particularly on the general subject of medical incunabula; the pest broadsides and pest tracts, the herbals, bloodletting calendars, syphilis tracts, treatises on surgery, etc. For example before performing a phlebotomy in the Middle Ages one consulted the stars and the bloodletting calendar to see if it was a lucky or unlucky day for this particular operation.

This book, however, makes a poor text for such a discussion as its author, Rabanus Maurus, Archbishop of Mainz, died in 856 and the article on medicine was written in the ninth century and not in the fifteenth. Here an extraordinary thought intrudes itself. This book is a general encyclopedia written by one of the foremost scholars of the age of Charlemange, Rabanus, who has been called the creator of education and schools in Germany. Adolf Rusch, the printer, looking around for something worth while to publish from the vast collection of manuscripts available chooses this encyclopedia that is then 600 years old. Things certainly did not change much in the Middle Ages. The great revival of learning under Galileo, Vesalius and Harvey was yet to come and the ideas current in the ninth century still satisfied the minds of the fifteenth. Thus among other unique things, this book is the first of all printed encyclopedias and the work, the fourth of all known manuscript encyclopedias.

The fact has already been noted that the twentieth century has taken more interest in incunabula than ever before. This has been a real interest that has not stopped at merely collecting and identifying and cataloguing the incunabula and then putting them on the shelf but has gone on to study of their actual contents. This modern point of view then should be the guide for us here. What of medical interest or value has this first medical incunabulum?

As far as can be ascertained neither the whole book nor the article on Medicine has been translated into English. The author was fortunate in obtaining the services of Miss Louise Conklin of Mr. Morgan's library as translator, one thoroughly acquainted with Medieval Latin, of which there is no good dictionary, who has admirably translated the chapter on Medicine.

Those of you who are acquainted with medieval history and life know its contents already, with its hodgepodge of classic lore, religion and morals that passed under the name of Medicine. Medicine was then a part of philosophy and reasoned out from *a priori* hypotheses. It was the age of authority when the observation of natural phenomena was of minor interest. Although it may not profit us greatly to survey this viewpoint of the Middle Ages it nevertheless affords a certain satisfaction to realize how far we have gone since 856 and 1467. One must note, also, that the author of this encyclopedia is a priest and not a physician and so his viewpoint is ecclesiastical. It gives striking evidence of the domination of ecclesiastical authority over men's minds. The passage "all is lost which writers of secular works have written on the art of medicine" should be particularly noted.

The article on Medicine and Disease is found in book 18, Chapter v, and fills only 2 pages of the folio. It reads as follows:

BOOK 18 CHAPTER V ON MEDICINE AND DISEASES

Medicine is that which protects or restores the safety of the body. Its subject-matter has to do with diseases and wounds. And so there pertain to medicine not only those things which are employed in the profession of those who are properly called doctors, but also food and drink, clothing and covering, and, in short, all that defense and fortification of which a healthy body makes use against external blows and misfortunes. The name of medicine moreover is thought to have been derived from modus, meaning measure; that is, moderation or temperance. For in the face of excess nature is saddened; in moderation she rejoices. Therefore all who use paints or drink potions to excess continually suffer injury. For all excess brings not safety, but danger. Among the Greeks, indeed, Apollo was set up as the originator and founder of medicine: his son Aesculapius improved the art by praise and by work. But after Aesculapius was killed by a thunder bolt, a ban was placed on the study of medicine, and the art died with its master. And for five hundred years it remained in hiding, until the time of Artaxerxes, the king of the Persians. Then Hypocras, the son of Asclepiis, born on the island of Cos, called it forth once more into the light.

Health is the soundness of the body, and moderation in warmth and moisture, which is blood. And health [sanitas] gets its name from the state of the blood [sanguinis status]: all suffering of the body comes under the general head of disease, because the ancients used the word [morbus] to show by that term the force of death [mors] which comes from disease. The mean between health and disease is healing, which does not lead to health unless it fits the disease. All sicknesses arise from four humours; that is, from the blood, from the gall, from melancolia [black bile], and from phlegm; for from these arise the health and illness of men. For when the four increase too far beyond the bounds of nature they cause illness; moreover, just as there are four elements, so are there four humours, and each humour imitates its own element, blood imitating air; gall fire; bile earth; phlegm, water; and there are four humours, just as there are four elements protecting our bodies. Blood, according to Greek etymology, receives its name because it animates, sustains, and is alive. Bile [colera] the Greeks have named thus because it ends in the space of one day; bile and gall have the same name, colera. This is an effusion of the gall-bladder, for the Greeks call the gall-bladder cole. Melancolia gets its name from the mixture of the waste-matter of the black blood and the secretion of the gall-bladder, for the Greeks call black, melas and the gall-bladder, *cole*. Blood gets its Latin name, sanguis, because it is pleasant [suauis]; so that men in whom blood is dominant are gentle and pleasant; but phlegm is so called because it is cold. For the Greeks call severity flegmone. By these four humours, as we have said, men are made healthy or ill. For when they have increased too far beyond the natural limit, they cause illness. From the blood and the gall, indeed, arise those sharp pangs which the Greeks call oxea; phlegm and melancolia, on the other hand, are the causes of that disease which the Greeks call cronia. Oxea is an acute illness which passes swiftly or kills quickly, such as pleurisy or frenesis; for oxi in Greek means sharp and swift. Cronia is a long-drawn-out disease of the body which lingers for a long time, such as gout or a cough. Chronos means time in Greek. Certain diseases receive their names from their causes: fever receives its name from heat (fervor), for there is too much heat; frenesis is so called either from an impediment of the mind, because the Greeks call the mind frena, or because it causes grinding of the teeth.

The healing of medicine should not be scorned, because we read that holy men have made use of it. And in the book of Ecclesiasticus it is mentioned in these words: Honor medicine, because of necessity; for the Highest created it. For all healing is from God, since the Highest created medicine, and the wise man will not shrink from it. But, since all is lost which writers of secular works have written on the art of medicine, it will suffice here to mention what we have read in sacred books, because even the law mentions the various kinds of diseases. And the prophet Isaiah aided Ezechiel the king in Juda by means of the art of medicine. And Paul the Apostle told Timothy that a little wine was good. Faintness is a disease of the vices, as it says in Exodus. (If you observe my commandments, all that faintness which I have put upon Egypt I shall not put upon you.) Weakness shows lack of mental power, as in the Apostle: If a man be weak, let him eat vegetables. Fever is desire of the flesh-burning insatiably, as in the Gospel of Peter this is said figuratively of the father-in-law—that he is "fevered." Paralysis indicates a soul dissipated by vices and forced down upon the couch of the flesh in the weakness of sinners. As it reads in the Gospel: Behold the paralytic is borne upon a litter by four men. Dropsy signifies an avaricious man, because just as the more a dropsical man drinks, the more he thirsts, so the more money a miser acquires, the more he pants with the agonies of avarice. Leprosy is the false doctrine of heretics, and the many infidelities of the Jews or the contamination of sinners, as in Leviticus: The Lord spoke unto Moses and Aaron: When a man shall have in the skin of his flesh a rising, a scab or bright spot, and it be in the skin of his flesh the plague of leprosy, then shall he be brought unto Aaron the priest, or to one of his sons: And the priest shall look upon the leprosy in the skin, and when the hair is turned white, he shall be a leper, and the priest shall set him apart. (Lev. 13. 2–3.) Lepers are those heretics who blaspheme Jesus Christ. Lepers in their beards are those heretics who utter vile things about the conception of the Savior and the Holy Apostles. Lepers in their whole bodies are those who add to this blasphemy blasphemy against the whole of the Scriptures. Swollen leprosy is puffed-up pride; mean leprosy is pretense of heart or hidden blasphemy. Red leprosy is anger in the heart; white leprosy is hypocrisy. Leprosy in the home is lack of faith in all the people. Leprosy of the garments signifies the vices of the flesh. Leprosy of the living flesh is a sin of the soul. Winged leprosy is untempered speech, generating of itself vice and the flow of seed: nocturnal pollution is the hidden thought of the sinners. The mind of a menstruating woman is polluted by worldly thoughts; as it says in Jeremiah, all that seek her shall not fail, etc. The issue of blood is the flow of sin. Weakness of the limbs is weakness of mind. As it says in Leviticus: The Lord spoke unto Moses, saying: Say unto Aaron and his sons: Let not any man of your seed approach the altar with blemished sacrifices, nor offer bread to the Lord, if he be blind or maimed, or have a broken hand or a twisted nose, or be humpbacked, or have inflamed eyes, or impetigo on his body, or scabies, or be too fat, etc. He is called blind who is deprived of the light of heaven so that he does not know whither to direct his steps in his work. On this blindness Malachai spoke to the priests: If you offer a blind animal for sacrifice, is that not wicked? And it is accepted in good part, as it reads in the Gospel: If you are blind, you shall not have sin. A mute is a man who does not preach the word of God or sing praise to God.

A deaf man is one who scorns to hear the word of God. His ear is broken who does not show obedience to the precepts of God. The man who has inflamed eyes is he who has native intelligence but whose worldly cares do not permit him to contemplate higher things. The man with the twisted nose is the one who is not fitted to discriminate between good and evil. His tongue is cut out who does not confess the true faith. He has a broken hand who is foolish, and avoids the straight path. He is lame who sees where the path of work lies, but whose mental weakness does not allow him to do well. And it is accepted in good part in the Gospel: Lead hither also the poor and the weak. His eyes are inflamed whose earthly cupidity crushes him down, and does not allow him to raise his eyes to the contemplation of heavenly things. His virility is gone who has no vigorous power against vice. He is too fat whose depraved thoughts weigh incessantly upon his mind. He has scabies upon his body whose mind fleshly luxury has destroyed. He has impetigo whose heart is dominated by avarice. Others recognize this impetigo as the schemes of heretics. He is torn away who is separated by the needs of his sins from the body of Christ, which is the Church. Christ is a doctor. As in the Gospel: Well men have no need of doctors, but those who are ill do. Resin is the medicine of holy men, according to Jeremiah. For is there not balm in Gilead? Is there no doctor there? Likewise in Jeremiah, it says to apply balm to a soul weakened by the faintness of sinners, that the person may be well of grief.

Odor is derived from aer [air]. That which has odor is called in Greek thimiama, for timo is the name of the flower which has an odor, in which connection, see Virgil, "redolent with thyme." Incense is so called because it is consumed by fire [igne consumitur] while it is being offered. Incense signifies the purity of prayer, wherefore it is said in the Psalm: Let my prayer be directed into your sight even as the incense. And in Exodus the Lord says to Moses: Take unto thyself this aroma. Myrrh and onitis and galbanum have a good odor, and the whitest frankincense (all are of equal weight) and so has the outer part of thyme, when pure, and carefully mixed, with all the art of the unguent maker. We create a fragrant odor when we anoint the altar with many good works and virtues, which may be mixed and pure, because as virtue is added to virtue, so the incense of good works is more sincerely exhibited. Therefore to reduce spices to dust is to grind virtues down by reviewing them, and to examine them carefully. A fragrant incense from pigments is pleasant in burning, and sends up from the coals a very agreeable smoke toward the sky and mingles itself with the various odors in most pleasant fashion. Thus the prayers of the blessed, burned in the fire of charity, come before the divine eyes, and are uplifted by the force of humility and remorse. For the Lord delights as much in virtues as in sweet incense for it is said in the Apocalypse that the Lord accepts a holy prayer just as if it were the sweetest incense. An angel stands beside the altar of the Temple, holding a golden censer, and the smoke of prayer ascends from the hand of the angel into the sight of God, that he may choose from the prayers of the saints which are before God.

And so endeth the chapter. Ideas so fantastic as to make us smile with pity at their ignorance, but possibly the good Archbishop was not completely wrong. Avarice possibly does give one the jim-jams or the impetigo.

Yes we will not laugh too loudly. There is still much to learn. Listen to Rudyard Kipling:

Yet when the sickness was sore in the land
And neither planet nor herb assuaged,
They took their lives in their lancet hand
And oh, what a wonderful war they waged.
Yes, when the crosses were thick on the door
Yes, when the terrible dead-cart rolled
Excellent courage our fathers bore
Excellent heart had our fathers of old
None too learned, but nobly bold
Into the fight went our fathers of old.

And before going into the fight they consulted this book by Rabanus Maurus.

ASSYRO-BABYLONIAN OPHTHALMOLOGY

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INTRODUCTION

CLASSICAL traditions have afforded scanty information on Assyro-Babylonian medicine. The Greek sources of the ancient Mesopotamian art of healing have been particularly derived from the narratives of travelers. If we trust Herodotus[1] who relates,

> They have no physicians, but when a man is ill, they lay him in the public square, and the passers-by come up to him, and if they have ever had his disease themselves or have known any one who has suffered from it, they give him advice, recommending him to do whatever they found good in their own case, as in the case known to them; and no one is allowed to pass the sick man without asking him what his ailment is . . .

we have a picture of primitive medical treatment which is suggestive of what a traveler might see in an isolated small city-state. According to the recent interpretations of Assyro-Babylonian cuneiform texts, however, we find Herodotus possessed a false impression of the actual elaborate organization of Babylonian medicine.

The history of Assyro-Babylonian ophthalmology is inseparably bound to the history of this ancient medicine.

THE BEGINNING

In the legendary history of the Mesopotamians is the beginning of medicine. Berossus,[2] a Chaldean priest, at the command of Antiochus I Soter, the third successor of Alexander the Great, wrote an account in Greek of Babylonia. Only fragments of his work exist. Although it was written at a time when the Babylonians were almost extinct, it passes on the primeval legends of the Babylonians. Berossus relates that in the beginning the universe was a chaos of water. Bêl (Marduk) began the creation of the world by building the city of Eridu of the Sumerians. Bêl then moulded men out of wet clay so that, by building temples and giving sacrifice, the men might "cause the gods to abide in the dwellings of their delight." Ea, the water god, took his residence in the city of Eridu, and Nannar (Sin), the moon-god, in the city of Ur. A celestial war which followed among the gods resulted in a flood which destroyed mankind. After Bêl and the good gods had conquered the evil ones, each benevolent god chose to rule over an earthly city and establish his shrine there. The gods, however, considered themselves so far removed from the people that they appointed the early governors as stewards to take care of their affairs on earth. The governors, or kings, acted primarily as representatives or "tenant farmers," of the gods and secondarily as rulers, or "great men," of the people. Eridu was the first city to have a post-diluvian king, named Aloros. Since the people were uncivilized, Oannes, a monster in the form of a human covered by a fish cloak (Fig. 1), taught Aloros and his subjects until they learned the arts, laws and sciences, including medicine, and since then "nothing more has been invented." This is a legend characteristic of the Babylonians.

The influence that water has on the life of man in the Euphrates valley easily gave Ea (Oannes) a chief place in the pantheon as the god of mankind to whom one turns in the time of trouble. He is the god of wisdom who instructed mankind in handicrafts and invented the art of writing. He also taught man to overcome his enemies by the use of magic and incantations and was the arch-magician and master diviner. The priests of Eridu considered Ea the god of healing in the ceremony in which the sick man was sprinkled with water, and in which the demons causing the disease were exorcised by incantations. This rite was later elaborated and passed on by the Babylonians to the Assyrians.

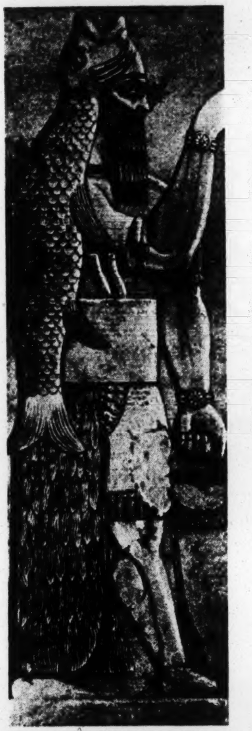

FIG. 1. EA (OANNES) WEARING FISH-CLOAK. ALABASTER RELIEF. (FROM LAYARD.)

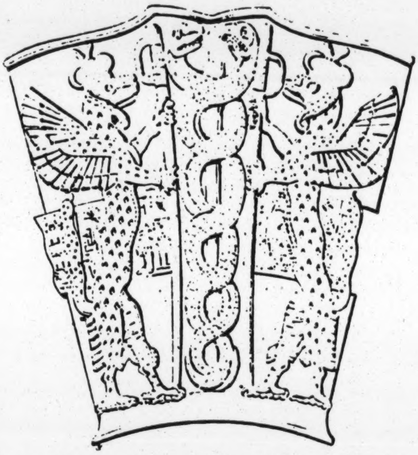

FIG. 2. LIBATION VASE OF GREEN STONE. (2350 B.C.) (FROM HEUZEY.)

Ea thus began his career as a local deity of Eridu, one of the oldest cities of Sumer on the Persian Gulf. On the Babylonian clay and the Assyrian stone reliefs Ea is represented as a monster in the form of a man enveloped in a split fish cloak. With the political ascendency of the city of Babylon, Marduk (Bêl), the son of Ea, rose to the head of the pantheon in the development of the religious practice of Sumer and his shrine, called E-sagila, "the lofty house," was created in Babylon. Later priest-physicians were taught by the goddess Nin-kharsag and other gods whom she created to heal special diseases. Ninurta and his consort Gula, and Ninazu, the patron of physicians, and his son Ningishzida were other gods of healing. The symbol of Ningishzida was a two-headed serpent coiled around a staff. The symbol of the medical profession today, the caduceus, has this same form. The symbol of the goddess Gula who revived the dead was a dog. Pausanius (ii, 27) observed that the statue of Aesculapius at Epidaurus showed the god with his hand on a snake and a dog at his feet. Although other gods were thus called upon by the priests and people to influence the healing of disease, Ea and his family retained the supremacy; therefore, Ea may be considered the first physician, and the founder of the art of Assyro-Babylonian medicine, which naturally includes ophthalmology.

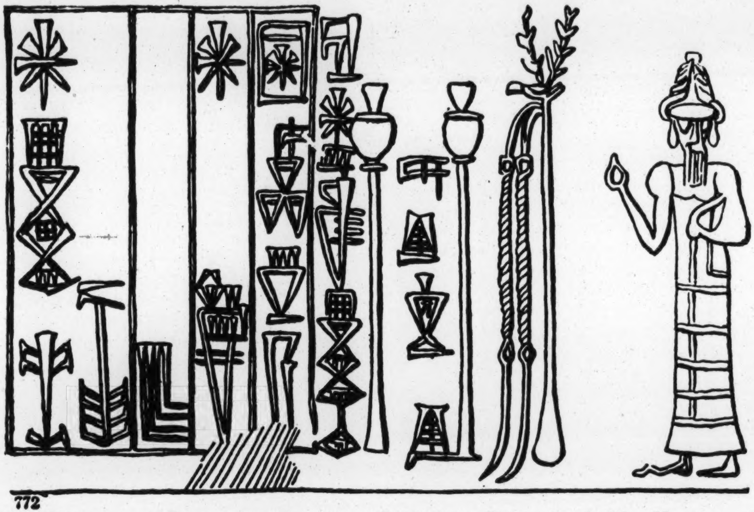

Fig. 3. Seal Cylinder of Babylonian Physician. Limestone Cylinder, 60 Mm. High and 33 Mm. in Diameter. (From de Sarzec.)

The Physician

Since the art of healing was taught to man by Ea at Eridu it may be assumed that the Sumerians spread their medical practice over Babylonia. The ancient Sumerians believed the malignant devils and spirits were the cause of all bodily diseases, and it was therefore logical that the priests became the first physicians. In the course of time they discovered that incantations and magic were not always efficacious and they began to employ many materials as aids for healing. As the rituals gradually became more complex, the therapy grew more practical. The use of incantations and magic was never abandoned in the history of the Babylonian medical treatment.

In the course of the progress of treatment a partial differentiation was made between the physician, surgeon and veterinarian. The Code of Hammurabi[3] shows that before 2000 B.C. the surgeon performed operations on or about the eyes. The empiricism of surgery and the custom of passing knowledge of surgery from father to son and master to pupil were the probable reasons for its differentiation. Records of the long incantations, various rites and complex prescriptions to aid the memory were not necessary to surgery, and therefore there has been practically no recovery of surgical tablets. Although for ancient people an unusually complete anatomical nomenclature was used,[4] the surgeon's knowledge of anatomy must have been scanty and since dissection was apparently unknown to them, they were incapable of performing intricate operations. Functional physiology was unknown.

Only a few Sumerian medical texts have been found but the Assyrian texts reveal that the physician made lists of the diseases that affect the eye and various parts of the body, gave the diagnosis, wrote and made up prescriptions, and suggested the therapy. The prescriptions were carefully made up by measure. After the drugs were powdered by heating or pounding they were made into tinctures, decoctions, extracts, or were incorporated into oil or fats. The medicated fats were applied to dressings and bandaged on the eyes or forehead. A metal tube or reed was employed to introduce the medicine into the eye. A copper or bronze knife was employed for operations on or about the eye.

The course of study of medicine, surgery and pharmacy for the physician was conducted by the priests.

SCHOOLS

Medical education was centered in the temples. Schools were associated with every large temple for the instruction of a selected group of boys and girls by the priests and scribes. The pupils made copies of the various religious texts used by the priests. As Budge[5] says, "The Ancient Egyptian mother took bread and beer to her boy when he was at school, but whether the Babylonian mother did so it is not known." If the boy after learning to read and write correctly was capable of continuing his scholastic work and it was desirable to have him trained in medicine he was tutored by an expert attached to the temple. He read the medical texts with the lists of symptoms, rites, incantations and the lists of drugs. He prepared medicines and treated patients under the direction of his tutor. In the study of medicine he included the study of eye diseases. If he was chosen to become a priest or magician, he was placed under the care of a priest of the temple to study the incantations, rites, ceremonies and divinations of the magical and religious literature. For either profes-

FIG. 4. CLAY IMAGE OF DEMON. (FROM BOTTA AND FLANDIN.)

sion the chief source of his materials for study was the temple library.

MEDICAL LIBRARIES

The temples were depositories for medical literature. Every large temple possessed a room or "library" containing texts for the use of the pupils in the school. A larger room was filled with tablets upon which were written incantations, divinations, medical prescriptions, magical inscriptions and other religious works. The tablets of the same subject were kept either in reed baskets or in clay boxes in rows on the shelves. The "Keeper of the Temple Library" was probably a priest who was in charge of the use and replacement of the tablets. Evidently the Assyrians possessed private libraries, but not the Sumerians.

The number of tablets recovered has been in the thousands in spite of the loss of an enormous quantity of them. The knowledge of the medicine of the Assyrians and Babylonians has come chiefly from the large library in the palace of the Assyrian king, Ashurbanipal (668–626 B.C.), which was discovered by Lanyard in 1849 upon the excavation of the mound Koujunjik near Mosul on the site of the ancient capital, Nineveh. About 30,000 pieces of tablets were found. Of these, nearly 800 fragments pertain to medicine. Ashurbanipal recorded that the tablets were revised and compiled and not only copied from older copies. Most of the tablets of this library and the library of Nebo are in the British Museum[6] and a few are in Berlin.[7] About 1000 medical tablets of the library of Asshur (Kaleh Shergat) are in Berlin. There are two medical tablets (*ca.* 500 B.C. and 2000 B.C.)[8] in the University of Pennsylvania and at least one Neo-Babylonian (*ca.* 500 B.C.) medical tablet in the Constantinople Museum.[9] Since only a few Sumerian medical texts have been found, only a little is known of the history of medicine in Sumer. The tablets unearthed at Shirpurla (Lagash), Abu Habbah (Sippar), El Oheïmer (Kish), and Niffer (Nippur) have been found to be chiefly non-medical. A number of letters of Assyrian physicians (*ca.* 700 B.C.) have been found and edited. Only one text of a medical compendium[10] belonging to a private library of a physician of the seventh century B.C., has been discovered.

MEDICAL LAWS

The first code of medical laws relating to ophthalmology was probably devised by the Sumerians. The oldest known prototype of a Babylonian code of laws[11] was introduced by Urukagina (*ca.* 3000 B.C.), a king of the Babylonian city of Kish, and the first systematic record of laws by Dungi, king of Ur (*ca.* 2294 B.C.). After Hammurabi (1958–1916 B.C.) had conquered the whole of Babylonia he formulated a famous Code of Laws[3] which was used to regulate the affairs of his subjects. It reverted to older Sumerian codes.[12] The laws were not devised by him but they were drawn up from the earlier codes which had been in existence for many centuries. He had this code cut upon a large diorite stele, which was set up in E-sagila, the Temple of Marduk, in Babylon so that every man could consult it when in doubt about the law. The text was studied in the temple schools for many centuries after the death of Hammurabi. It was carried off later to Susa (Shûsh) by an Elamite king in 1200 B.C. In

1902 it was found by J. de Morgan in the ruins of Susa.

The sections of this law relating to the eye read as follows:

196. If a man destroys the eye of another, his own eye shall be destroyed.

198. If a man has destroyed an eye or a limb of a poor man, he shall pay one maneh of silver.

199. If a man has destroyed an eye or limb of a servant of another man, he shall pay one-half of a mina.

206. If the wounded man be a gentleman, and the stricken be a gentleman, he shall pay half a maneh of silver.

208. If he be a poor man, he shall pay one-third of a maneh of silver.

215. The doctor who treats and cures a gentleman's wound, or has operated on the eye with a copper lancet, shall charge 10 shekels of silver.

216. If the patient be a poor man, the doctor shall charge 5 shekels of silver.

217. If the patient be a servant, his master shall pay the doctor 2 shekels of silver.

218. If a doctor operates on a wound with a copper lancet, and the patient dies, or on the eye of a gentleman, who loses his eye in consequence, his hands shall be cut off.

The spirit of the law was relatively humane and just, and was based on the adjustment between a crime or an injury and the fine or punishment. It also regulated the fees to give a fair compensation for benefits conferred. In a later period after Hammurabi, the litigants had decisions made by civil judges who acted in the name of the king. If the case was appealed it could be taken before the court of priest-judge and if necessary before the king.

The laws were probably never repealed. The punishment for the physician was fines, corporeal injury or imprisonment.

It is also interesting to note that the physician gave no medical treatment on the seventh, fourteenth, twenty-first and twenty-eighth days of the month, and to those was added the forty-ninth day, counted from the beginning of the preceding month, because these days were considered unlucky.

PATIENTS

At the time of Hammurabi, there were three classes of patients and compensations:[5] (1) the *Amelum:* king, governors, nobles, landed proprietors, priests, high governmental officials, and highly skilled craftsmen. Later the term Amelum lost its original meaning and was used for "man" with no reference to position or property; (2) *Mushkînu,* or "serf" who lived in a special part of the city. His fees and fines were less than those of the Amelum. The term later was equivalent to a poor man, or beggar; (3) *Wardum,* or slave who was the property of the master. He could own property and purchase his freedom. According to the code, the gentleman paid the surgeon 10 shekels of silver for the treatment of an eye wound, a poor man 5 shekels and the slave 2 shekels. Nothing is known of the compensations for medical treatment.

MEDICAL CORRESPONDENCE

In the royal archives, there was discovered in the correspondence of the King Esarhaddon, brother of Ashurbanipal (668–626 B.C.), a letter written by the court-physician, Arad-Nanâ, to the king concerning the progress of the treatment of the injured or diseased eye of the prince.[13]

To the king my Lord, your servant Arad-Nanâ. May it be surpassingly well with the king, my Lord. May Ninib and Gula grant health of mind and body to the king, my Lord:

It is very well indeed with this unfortunate man whose eyes are diseased. I had put a dressing on them that covered his face. Yesterday toward evening, the bandage which held it on I removed. I took off the dressing that was there. There was pus upon it the size of the tip of the little finger. Whoever of your gods has put his hand to this case, has himself surely given his orders (explicitly). It is extremely well. May the heart of the king my Lord be of good cheer. In seven or eight days he should be well.

Judging from the letter, the treatment was practically modern. The attitude of Arad-Nanâ suggests the most approved bedside manners.

ETIOLOGY

The Assyro-Babylonian conception of the etiology of ocular diseases as well as other diseases was based on the universal theory of animism.[14] Primitive races, without the background of accumulated knowledge of medicine, arranged the disorders of the body into two classes. In the first class belong the injuries and obvious sicknesses produced by some living creature or some definite substance; in the second class are the mysterious diseases such as constitutional maladies of unknown cause. The etiology of the latter is based on the animistic theory that all objects, especially those that have activity, have a natural life and are represented by spirits, demons[15] or gods who interfere with the vital process and consequently produce the disease. In agreement with this theory the Assyrians and Babylonians differentiated their spirits and devils of disease into various kinds. Some of these malignant demons affected a particular organ and some produced a specific type of disease. "Tiu," the special demon for headaches, from acute pain to insanity, was an example of the latter kind. In the early history of Babylonian medicine even the sounds and words began to be considered as the cause of sickness. According to the Nippurian school, sin causes the gods to send affliction upon mankind by means of their "word," which is spoken and sent forth as an angry spirit to seek the abode of the victim. If one had sinned against a god or was judged unfavorably by a god, then a sorcerer or sorceress through words and magic had the power of bewitching the victim with the help of a demon and thus producing illness. A person possessing a cataract, squint or other such evil eye was unusually capable of causing a demon to enter another's eye.

Etiology, however, played a minor rôle in the diagnosis of ocular diseases.

DIAGNOSIS

The physician in diagnosing a disease of the eyes employed his clinical acumen. He often studied or referred to the texts which frequently grouped ocular diseases together according to the symptoms such as, "if a man's eyes are full of blood," "if a man's eyes hurt," and, "if a man's eyes are full of yellow rheum." If the eyes were affected in a systemic disease, the diagnosis would probably be found under the description of the appropriate conditions. For the description and classification of an unusually complicated ocular disease, the physician was obliged to refer to his past clinical experience. The diagnosis remained rather simple while therapy became relatively complex.

THERAPY

The original fundamental principle of Sumerian therapy of ocular disease was the expulsion of the demon causing the disorder. It was not irrational, therefore, to believe that incantations, such as oral exorcisms to drive out the demon, would effect the cure. By 3000 B.C. the early simple Sumerian incantations had multiplied into complex texts and had also developed into magical rituals. In the library of Ashurbanipal several series of elaborate incantations associated with symbolical magic which were used by the priests of both the Assyrians and Babylonians, were found. Among the first original rites was the water ritual of Ea at Eridu which was based on the symbolism of water purifying or cleansing the patient from the demon of disease. A charm referring to water ritual to be recited in case of diseased eyes is as follows[6a]:

> Of these twain the daughter of Anu between both built a wall; the one will not move in accord with its fellow. Whom shall I send to the daughter of Anu of Heaven, that they may bring me their ewers of hulalu, their basins of bright lapis that they may gather the waters and bring them to the failing eyes, the painful and troubled eyes?

Another incantation mentions Ea as the god who heals the blindness produced by the dust brought by the wind.

> In Heaven the wind blew and brought blindness to the eye of the man: from the distant heavens the wind blew and brought blindness to the eye of the man. Unto the sick eye it brought blindness; of this man his eye is troubled, his eye is pained. The man weepeth grievously for himself.
>
> Of this man, his sickness Ea hath espied and said "take pounded roses, perform the Charm of the Deep, and bind the eye of the man." When Ea touched the eye of the man with his holy hand, let the wind which hath brought woe to the eye of the man go forth!

Another incantation is:

> O clear eye, O doubly clear eye, O eye of clear sight: O darkened eye, O doubly darkened eye, O eye of darkened sight! O eye of sleepy sight, O eye of . . . sight, O eye of evil sight! O failing eyes, O painful eyes, . . . eyes, like the slaughter of a sheep . . . like hay thrown away, like a cup of sour wine thrown away. . . . Of these twain Nergal between them a boundary hath set. . . . It is the charm of Ea and Marduk . . . the charm of Nin aḫa-kuddu the mistress of charm; Gula, quicken the recovery, thy gift.

Related to the water ritual, was the symbolic fire ritual which consisted of the burning of images of the sorcerer by whom the patient had been caused to be diseased. The images were constructed of various substances. Wool, grain, fruit and other materials were also burned with magical ceremonies and incantations. The fire ritual was recorded in detail in the "Maklû and Shurpû" series of texts.

Incantations given with prescriptions were frequently advised for diseased eyes.[6a] One for blood in the eye reads:

> Sound front, sound back, smitten front, smitten back. . . . Flesh multiplieth flesh, blood produceth blood, dung

> createth dung: Perform, O Gula, the high Charm of Life! Let them bring nigh the cataplasms which thou hast arranged and grant recovery.

Another with magical rites:

> The eye of the man is sick, the eye of the maid is sick, the eye of the man and the maid who shall heal? Thou shalt send, they shall receive. Pure palm-fibre thou shalt chew in thy mouth, twist with thy hand, bind the man or maid on their temples; the eye of the man or the maid will recover.

Another series of rituals to be applied with the incantations:

> Red wool, white wool separately those shalt spin: seven and seven knots those shalt tie in each: as those tiest, thou shalt recite the charm; the thread of red wool thou shalt tie on his eye which is sick; the thread of white wool thou shalt tie on his eye which is whole, and he will recover.
>
> Sound front, sound back, smitten front, smitten back: thou art a true hero, thou a weak reed.

Whether the magical rites were entirely performed by the physician is not known, but by the seventh century B.C. the offices of the magician and physician were separate. A monthly report of a state astrologer (Thompson) says: "Bel-epush the magician is very ill; let the king command that a physician come to see him."

MEDICAL THERAPY

The medical therapy of ocular diseases was remarkably elaborate. According to the tablets it may be divided into the pharmacopeia and applied therapeutics.

The section of the pharmacopeia concerning drugs for eye diseases gave the lists of drugs generally arranged into three columns, the name of the drug in the first column, the name of the eye disease for which the drug was to be used in the second column, and how the drug was to be used in the third column. Parts of plants[16] constituted the largest number of drugs. The plants included cummin, caraway, cassia, rape, storax, tannin, honey, mint, onions, grain, a large variety of reeds and thorny plants, shrubs and trees. All parts of the plant were utilized. Alkalies, salts and many minerals, such as sulphur, alum, and copper oxide were used. The drugs were made into powders, washes, ointments and salves. They were mixed with wine, water, milk, oil or with mixtures of these liquids. They were applied as poultices or dressings of cloth or leather, as ointments and salves, as hot or cold applications, or if powdered blown on the eye through metal or reed tubes. If the drug was given by mouth it was given preferably before meals.

The texts of the prescriptions may be considered as a part of the applied therapeutics. For each patient with an ocular disease, the physician necessarily had to choose the kind of treatment. If medical therapy were needed, he had a choice of several prescriptions. If one prescription failed to produce a cure another might be selected until all of them were tried. As a last resort magic fortunately could be called on. Medical prescriptions were generally more or less associated with magic or incantations.

The Assyrian medical texts[6a] are fragmentary and only a few are sufficiently undamaged to be used for quotations.

For *soreness* about the eyes, the part was anointed with the urine of a white dog. Powdered asafoetida in beer to be taken before meals was also recommended. Powdered castor-oil plant, fennel and storax mixed in crude petroleum was also used.

For *itch* (scabies) about the eyes, the lids were anointed with a mixture of powdered fennel in oil. Sumack, castor-oil plant, fennel, cummin and tamarisk root were also employed as drugs.

It had been observed that strong drink caused men to stagger and to see double. For *diplopia* a mixture of equal parts of black snake fat, lion fat, opium, asafoetida gum, and Salicornia-alkali mixed with powdered copper in wild honey was to be applied.

For *dazzling* eyesight, or *photophobia*, it was recommended that one should go into a dark room, and say, "Away with your dazzling."

For *photophobia* powdered iron ore, iron sulphate, copper, lead, arsenic, tamarisk-seed, laurel-seed, in the suet of the kidney of a black ox was recommended.

An *entropium* could be helped by the application of equal parts of salt, tannin, alum and fat. The tannin and alum acted as astringents to shrink the conjunctiva.

Chalazion (or hordeolum) was cured by a poultice of reed pith, barley flour, and gazelle dung in milk deodorized with attar of roses. The directions indicated it was to be applied for fifteen days. The heat of the poultice tended to localize the inflammation and the non-pathogenic bacteria of the dung helped to kill off the pathogenic ones.

To *pterygia* was applied nettle seed in honey or arsenic curd. For pterygia with senile blepharitis, opopanax, storax, cantharides and salt in cedar oil formed the proper unction.

For *dacrocystitis:*

> [If the right side of a man's forehead] is affected, and the tears of his right eye are involved, take bits of powdered turnip seed mixed together with . . . pour cassia juice over it, apply to the forehead, and he will recover.
>
> If the left side of a man's forehead is affected and the tears of his left eye are involved, take bits of oleander, crush and strain, pour into heated wine, apply to his forehead, and he will recover.
>
> If both sides of his forehead are affected, and the tears of both eyes are involved, take bits of oleander, cassia, powdered turnip, finely cut radish, mix together in a Kan-Shar vessel, pour cassia juice [over it], bind both sides of the forehead, and he will recover.

For *xerosis:*

> If a man's eyes are affected with dryness, he shall rub an onion, drink it in beer, apply oil to his eyes.
>
> Thou shalt disembowel a yellow frog, mix its gall in curd, apply to his eyes.

For *solar conjunctivitis* an application of a mixture of powdered storax, cantharides, alum, myrrh and roses, or storax, alum and "salt of Akkad" was employed. Fir turpentine, flour of roasted grain and roses were useful.

Another incomplete text refers to the prominence of the eye and to the dimness of the upper visual segment which is suggestive of a retinal detachment. The drugs recommended were holium boiled in milk, hellebore, opopanax, corn flour and flour of the Lathyrus.

For *acute purulent conjunctivitis:*

> If a man's eyes are sick and matter is secreted on his temples, thou shalt spread

tanners' verdigris on vellum, on his eyes bind: bray copper-dust, arsenic, yellow sulphide of arsenic, mix in curd, apply to his eyes.

If his eyes are sick and are dim, pinecone gum in water shalt wash, bind: fruit of the poppy, storax, thou shalt apply.

For *iritis:*

If a fever seizes a man, localized in the nerves of the forehead,* and it affects the eyes, so that his vision is clouded and he is afflicted with an acute inflammation, and his eyes water, pound one-third of a Ka of powdered "torn" root with khaltappanu stone, take one-third of a measure of it for the head that pains; knead with cassia juice, wrap it around [the head], attach it [by means of a bandage], and for three days do not remove.

A headache on the right side with a swelling in the right eye and abundant flow of tears is put down as "due to the hand of a demon," and the remedy prescribed is to "rub the head with finely powdered bits of human bone mixed with cedar oil." A similar explanation is offered for headaches accompanied by vomiting and swelling of both eyes, while a persistent headache lasting from sunrise to sunset is ascribed to the machinations of a demon or a sorcerer, as the case may be.

For *blood in the eye:*

If a man's eyes are sick and full of blood, unguents irritating the blood, blood and tears coming forth from the eyes, a film closing over the pupils of his eyes, tears turning to film, to look, oppressing him: thou shalt beat leaves of tamarisk, steep them in strong vinegar, leave them out under the stars; in the morning thou shalt squeeze them in a helmet: white alum, storax, "Akkadian salt," fat, cornflower, nigella, "gum of copper," separately thou shalt bray: thou shalt take equal parts of them, put them together; pour them into the helmet in which thou last squeezed the tamarisk; in curd and šuniš mineral thou shalt knead it, and open his eyelids with a finger and put it in his eyes. While his eyes contain dimness, his eyes thou shalt smear, and for nine days thou shalt do this.

If ditto, myrrh, storax, "Akkadian salt" through a bronze tube into his eyes thou shalt blow.

If ditto, "gum of copper" and storax thou shalt bray, through a bronze tube into his eyes, thou shalt blow.

If ditto, mint and storax thou shalt bray, through a bronze tube into his eyes thou shalt blow.

If a man's eyes are full of blood, . . . and the middle of his eyes are red, his eyes being dim, thou shalt reduce roses . . . in cow's milk or in the milk of a harlot thou shalt knead and bind on. In the morning thou shalt take it off, and bray arsenic in curd, his eyes rapadi-plant on a bronze blade thou shalt anoint. A thread of blue wool and of white wool thou shalt spin, twist, bind on: . . .

If a man's eyes are changed to blood, seed of eruca, mountain-honey, yellow sulphide of arsenic thou shalt mix and apply.

1 shekel of cantharides, ½ shekel of storax, ⅙ shekel of "Akkadian salt," thou shalt bray, apply to his eyes.

Thou shalt apply to his eyes dry storax: therein yellow sulphide of arsenic. . . . Thou shalt bray the dung of a lizard in marrow of thigh bone, without a meal, thou shalt apply.

If from a man's eyes blood has dropped and has stopped: the gall of a male sheep, the fat . . . Ricinus thou shalt bray in curd and apply. . . .

For *sick eyes:*

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* Headache.

If a man's eyes are sick, ammi, hyoscyamus, roses, holium, măstabplant, fat of opopanax, seed of pine, gall of the tanners . . . in curd, suet of the kidney of a male sheep, wax of honey thou shalt include, apply to his eyes.

If a man's eyes are sick, storax in curd thou shalt bray and apply: If a man's eyes are sick, cantharides in curd thou shalt bray and apply.

If a man's eyes are sick, alum in curd thou shalt bray and apply: If a man's eyes are sick, holium in milk thou shalt boil and apply.

Wash his eyes until the tears cease to flow; take a bandage and tie it on. After that put him in a closed room: boil juice of kiptu [decayed grain], strain it [?] to a Kan-Shar [mortar?] vessel, and in the evening and morning rub his head.

For *jaundice*[7a] of the eyes:

If a man is affected with yellowness of the eye, and the disease spreads into his eye, so that the eye is green as copper . . . his abdomen is swollen, he gives back food and drink, that the sickness has affected his entire body, and that man will die.

If a man has yellowness of the eye, his head, his face, and all his body is affected even to the root of his tongue, which is affected, it is hopeless (?), he will die.

For *night-blindness:*

If a man can see everything by day but can see nothing by night, it is called "Sin-lurmâ."

The prescription reads:

If a man's eyes suffer from "Sin-lurmâ" thou shalt thread makut of the liver of an ass and flesh of its neck on a cord and put it on his neck, prepare a water pot; on the morrow thou shalt spread a cloth in the sun, prepare a censer of pine-gum; then thou shalt let this man stand behind the cloth in the sun. A priest shall take seven rounds of bread; he whose eyes are sick shall take seven rounds of bread: then the priest shall say to the sick man, "Receive, O clear of the eye": the sick man shall say to the priest, "Receive, O dim of the eye." Thou shalt chop up the makut of the liver [missing], assemble some children and they shall say thus: "[missing]," they shall say: "Thou shalt mix curd and the best oil together, apply to his eyes."

For example, night-blindness due to abnormal retinal fatigue is often found in tropical countries among soldiers and sailors, especially after exposure to bright sunlight.

In an incomplete text, there is mentioned a film of the eye treated with a bistoury. Whether or not this is a surgical treatment of *cataract* is difficult to determine.[17]

The present Arab treatment[18] of eyes has many procedures and therapeutic means suggestive of a Babylonian heritage. If they may be used as a criterion for the interpretation of the use of the bistoury, this instrument was not used in cataract extraction, but only for removing films from the conjunctiva and cornea.

PROGNOSIS

The prognosis of the disease was determined by the practice of divination[9] of the will of the gods by the interpretation of signs. The chief methods of divination may be classified into astrology, hepatoscopy, oil and water divination, birth, and dream omens.

Astrological divination was often employed to determine the outcome of the course of the disease. It was dependent upon the day of the month upon which the disease began and the movement of the stars during the progress of the disease.

Hepatoscopy, which later spread to Greece, Italy, Syria and even to China, rested on the idea that the liver was the seat of the soul. The outcome of the disease was indicated by the peculiarities of the anatomical markings of the liver of the sacrificial animal. Elaborate texts to cover all conditions were consulted by the diviner.

Oil and water divination was a comparatively simple procedure. The configuration and activity of the oil dropped on water suggested the prognosis of the disease.

The birth-omen texts give minute anatomical descriptions of the various signs which occurred at the time of the birth of the child or animal. Congenital abnormalities, pathological malformations, deformities, and monsters were catalogued and classified as to meaning.

The signs of nature, such as the flight of birds, and unusual growth of plants were also considered as a part of divination.

Dreams were used to interpret the future course of the disease. Moreover, divination was employed to foretell the probability of ocular disease and the proper method of prophylaxis of the disorder.

PROPHYLAXIS

The prevention of eye disease was attempted by many methods. The sacrifices were given to the gods to purify the sick and the sinning. Animals, fruits, herbs, and clay and metal objects were used as gifts for the sacrifices. The pious worshippers kept little images of the gods as amulets to ward off the demons of evil. The recitation of incantations and the performance of magic rituals in the temple and in the home by priests were inducive to healthy eyes. Apparently all ocular prophylaxis was based only on the prevention of the demon from entering into the eyes.

CONCLUSION

The knowledge of Assyro-Babylonian ophthalmology will never be completed until all the medical cuneiform tablets have been translated and the contemporaneous medicine of the ancient people associating with the Assyrians and Babylonians has been studied. Apparently the medical treatment of eye diseases was established early in civilization but in the lapse of time it acquired an unprogressive character and was never entirely divorced from magic and religion. Nevertheless these ancient pioneers brought ophthalmology through the primitive to the pre-scientific stage of medicine. The Babylonian magical treatment derived from the demon concept of disease is not so greatly variant from the present-day management of an ocular disease of unknown etiology. The accumulation of medical knowledge and experience of centuries makes us realize that we should sympathize with the early Babylonians in their treatment of eye diseases.

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MEDICINE IN HORACE WALPOLE'S LETTERS

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HORACE Walpole's long life (1717–1797) covered the greater part of the eighteenth century. He was not an altogether estimable character, being essentially a dilettante and a gossip and something also of a snob, but he was a shrewd observer of men and manners and he recorded his observations and reflections in an immense number of admirable letters which form his chief title to fame. These letters throw a vivid light on the political and social life of the period and it might have been expected that they would throw light on eighteenth century medicine also, especially as the letter-writers of that time were always fond of discussing matters of health. But this expectation is only partly fulfilled for considering the volume of his correspondence there is not a great deal of medical interest to be gleaned from it. Nor are the reasons for this far to seek. In the first place Walpole was not scientifically minded; his main interests were political, literary and artistic; and secondly, he had no friends in the medical profession. He was quite unlike his contemporary, Samuel Johnson, he did not admire doctors and cultivate their society. On the contrary, he says that he "abhorred" physicians and he was never tired of pouring ridicule and contempt upon them. He speaks of "the nonsense of physicians" and boasts that he almost never consulted one in his life. "The Jesuits are fallen," he writes, "but the time is not come for rooting out our physicians." When he heard of the sudden death of the poet Gray (from alleged "gout in the stomach") and that Plumptre, the Regius Professor of Physic at Cambridge, had refused to get out of bed in the middle of the night to attend him,* Walpole exclaims "Jesus! is their absence to murder as well as their presence?" He says in one letter: "consider that the physicians recommend wine (in gout) and then can you doubt of its being poison?" And in another: " . . . a little after I die the secret will be found out of how to live for ever—and that secret, I believe, will not be discovered by a physician." These quotations are representative of his general attitude but he has a shrewder dig at us when he writes, referring to certain politicians, "they choose to seem to deliberate like physicians who retire into another room and there talk news." Our only consolation is that he thought almost as badly of other professions. "In physicians I believe no more than in divines," and again, "Sure, the Devil's three names of Satan, Beelzebub, and Lucifer were given to him in his three capacities of priest, physician and lawyer."

Walpole was not alone in holding a low opinion of the physicians of his day; Lady Mary Wortley Montagu, for instance, though they agreed in little else, says much the same kind of things about doctors in her letters as Walpole does in his, and when we consider the backward state of medicine in the eighteenth century we cannot be surprised.

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* Plumptre was a very old man and was obliged to refuse all night work.

Just as Lady Mary, however, admired one doctor, a country practitioner in Italy, so Walpole believed in one physician, Johnson's friend, Dr. Robert James. He never tired, at all events, of praising James's well-known powder and both took it himself and recommended it to his friends. He had such a belief in the efficacy of this remedy, that he said he would take it "if the house were on fire," and that "he almost believed it would cure anything but the villany of physicians." In 1764 we find him writing to Mr. Churchill: "The cure performed by James's powder charms me more than surprises me. I have long thought it could cure everything but physicians." And ten years later to the Rev. William Cole: "Your illness, dear Sir, is the worst excuse you could make me; and the worse, as you may be well in a night, if you will by taking six grains of James's Powder. He cannot cure death; but he can most complaints that are not mortal or chronical."

On another occasion he writes to his friend Sir. Horace Mann:

> Lord Waldegrave is just dead of the smallpox. . . . He was taken ill on the Wednesday, the distemper showed itself on the Friday, a very bad sort, and carried him off that day se'nnight. His brother and sister were inoculated, but it was early in the practice of that great preservative, which was then devoutly opposed; he was the eldest son and weakly. He never had any fear of it, nor ever avoided it. . . . He died as he lived, the physicians declaring that if anything saved him, it would be his tranquillity: I soon saw by their ignorance and contradictions that *they* would not. Yet I believe James's Powder would have preserved him. He took it by my persuasion, before I knew what his disorder was. But James was soon chased away, to make room for regular assassins. In the course of the illness nobody would venture to take on them so important a hazard as giving the powder again; yet in his agonies it was given and even then had efficacy enough to vomit him; but too late!

GOUT

But the chief medical subject discussed in the Letters is Gout, and indeed the constant references to it become almost wearisome. As he says himself, "I can talk gout by the hour," and he does, or at least by the page. This was natural enough for he suffered severely from the disease himself throughout most of his life. He had his first attack, which nobody at the time believed was gout, at the age of thirty-six, and he continued to suffer from it till his death. Here is his account of the onset of his second attack in August, 1760:

> I have been out of order this fortnight, without knowing what was the matter with me; pains in my head, sickness at my stomach, dispiritedness and a return of the fever I had in winter . . . on Monday morning I was seized as I thought with the cramp in my left foot; however, I walked about all day: towards evening it discovered itself by its true name, and that night I suffered a great deal. . . . Nobody would believe me six years ago when I said I had the gout. They would do leanness and temperance honours for which they have not the least claim.

The disease took in him the classical form, beginning in the foot and afterwards involving the knees, wrists, elbows and finger joints. At first the attacks were biennial but later they became annual and towards the end of his life he was much crippled by it, and greatly troubled with tophi. He said he "had more chalk stones than joints in his fingers and that he must set up an inn, for he could chalk a score with more ease and rapidity than any man in England!" In January, 1786 we find him writing to Sir Horace Mann:

> I think, my dear Sir, that you will be glad to hear that I am getting free from my parenthesis of gout, which, though I treat it as an interlude, has confined me above six weeks, and for a few days was very near being quite serious. It began by my middle finger of this hand, with which I am now writing, discharging a volley of chalk, which brought on gout and inflammation, and both together swelled my arm almost to my shoulder. In short, I was forced to have a surgeon. But last week my finger was delivered of a chalk-stone as big as a large pea, and now I trust the wound will soon heal.

And again in September, 1793: "I have been very ill with gout for above a month; it began in my right hand, the middle finger of which opened, and discharged a sharp pointed chalk-stone, that literally weighs four grains and a half."

Like everybody else he had his own theory as to the nature of gout, which he expounds to the Rev. William Cole:

> How there can be a doubt what the gout is, amazes me! what is it but a concretion of humours, that either stop up the fine vessels, cause pain and inflammation, and pass away only by perspiration; or which discharge themselves into chalk-stones, which sometimes remain in their beds, sometimes make their passage outwardly? I have experienced all three. It may be objected that the sometimes instantaneous removal of pain from one limb to another is too rapid for a current of chalk—true, but not for the humour before coagulated. As there is, evidently, too, a degree of wind mixed with the gout, may not the wind be impregnated with the noxious effluvia, especially as the latter are pent up in the body and may be corrupted?

In the management of his "gouts" as he terms them, he relied on temperance and cold water used both externally and as a beverage. For the external use of cold water he had the precedent of Harvey who, it will be remembered, used to immerse his gouty foot in a bucket of it, but Walpole does not recommend its use by everybody. He says in one letter (September, 1793): "An account is come of the sudden death of Lord Buckinghamshire: he had the gout in his foot, dipped it in cold water, and killed himself," and then he adds, with one of his few lapses into bad grammar, "nobody can play such tricks with impunity but I."* He did not much believe in Bath which was then so fashionable as a spa for the gouty. "Bath is excellent," he says, "for those who are in travail of the gout and seek a fit as a composition for subsequent health, but I certainly have no occasion to accelerate the attacks." Nor does he seem to have taken any drugs for the disease. Colchicum was not in use at that time and opium was considered harmful so there was no way of relieving the pain. His great local remedy was what he quaintly terms the "bootikins." These seem to have been a sort of fingerless flannel glove or sock in which he had the greatest faith. He believed that their use both prevented and shortened the attacks so that the gout made "its grand tour" of his limbs in one month instead of five. "Surely," he says, "If I am laid up but one month in two years instead of five or six, I have reason to think the bootikins sent from heaven." And again:

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* Warner, whose book will be referred to later, had no doubt of the inexpediency and danger of cold bathing in gout, "it is so likely," he quaintly says, "to exasperate the Humours by the Tumult it occasions and to translate them crude and undigested upon some of the Nobler Organs, that none besides the young in Gout as well as in Years should ever venture upon it." Cold water as a drink for the gouty he thought "crude and pernicious."

> The bootikins do not cure the gout but if they defer it, lessen it, shorten it, who would not wear them? Why, fine people, younger people, who will not condescend to lie like a mummy; nay, nor any body else, for the physicians and apothecaries, who began by recommending them, now, finding they are a specific, cry them down . . . and will be believed, precisely because they lie; they say they weaken; it is false; I can at this moment stamp on the marble hearth with both feet with no more inconvenience than I did at five-and-twenty, which I never saw one other person that could do, who had the gout a twelvemonth before. I do this ten times a day to convince people; yet, what is ocular proof against the assertion of a grave face and a tied wig? If weakness were the consequence, who would be weakened so soon as I, who have bones no bigger than a lark's?

Naturally he was always trying, though not always with success, to persuade his gouty friends to use the bootikins too, and in January, 1775 we find him writing to Mann, "I want to send you a cargo of bootikins; tell me the shortest way of conveying them." The physicians, of course, did not approve of this amateur remedy, for, as Johnson said, "physicians do not love intruders." "These rogues," says Walpole in his polite way of referring to doctors, "persuade people that the bootikins are fatal. They now assert that my friend, Lady Hervey, who died of a diarrhoea, was killed by the bootikins she wore for the gout. All they can do is to keep up perspiration, which everybody knows is the only thing that can be done for the gout!"

The frequency of gout amongst the upper classes in the eighteenth century is very remarkable and there is convincing evidence of it not only in these Letters but in all the records of the social history of the period. Everybody who was anybody seems to have suffered from it. Dr. Ferdinand Warner, L.L.D., who, though not a medical man, wrote an excellent popular treatise* on the disease, published in 1769, speaks in his preface of the "gentlemen and ladies who have the honour to have the gout." He says, that he "jocosely" calls it an honour "because it is seriously affirmed that it is the inheritance only of the acute and sensible though others possibly may acquire it."

This is just another version of the old description of gout as "dominus morborum et morbus dominorum" which is probably still true, but why it was so common in Walpole's day as compared with now is a mystery. Perhaps there were more "domini" then but the usual explanation is that people ate and drank more in those days. No doubt many of them did, and Warner states that "he thinks gout has increased tenfold in England since port, Madeira, sherry and other inflammatory wines have come so much into use." (On the other hand it is interesting that the anonymous medical author of a "Treatise on Gravel and Gout" published in 1787 recommends these very wines as the safest in gout because they contain least tartar!) But anyhow by no means all the sufferers from gout could be described as intemperate. Walpole himself is a case in point. He says somewhere that he lived "like an anchoret" and we are told by one of his biographers that "His dinner when at home was of chicken, pheasant or any light food of which he ate sparingly. Pastry he disliked as difficult of digestion though he would taste a morsel of venison pie. Iced water, then a London dislike, was his favourite drink."

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* "A Full and Plain Account of the Gout, by Ferdinand Warner, LLD, London, 1768. From whence will be clearly seen, the Folly, or the Baseness, of all Pretenders to the Cure of it: In which everything Material by the Best Writers on that Subject is taken notice of; and accompanied with some New and Important Instructions for its Relief, which the Author's Experience in the Gout above Thirty Years hath induced him to impart."

It is true that he took no exercise but he was very active and was much on his feet, and Pulteney said of him that "he ran like a peewit!" It may be suggested that he inherited the disease but he rejects this explanation himself. "If either my father or my mother had had it," he says, "I should not dislike it so much. I am herald enough to approve it if descended genealogically; but it is an absolute upstart in me, and what is more provoking I had trusted to my great abstinence for keeping me from it. . . . "

There are two fallacies here however. In the first place his putative father, Sir Robert, although he did not have gout was greatly afflicted with stone and, secondly, there is some doubt whether Sir Robert really was his father at all and whether he was not an illegitimate son of Lord Hervey by Lady Walpole, in which case he might easily have inherited the disease. But is gout inherited? One can understand the inheritance of a gouty "constitution" but to produce the disease there must be an exciting cause and in Walpole's case at least that seems to have been absent.

Another mystery is the question of "misplaced" or "irregular" gout to which there are many references in the Letters. Walpole says that in the course of twenty years he had only had gout "one half-hour in the head and never in the stomach" but he often speaks of it in these situations in others. What was meant by "misplaced" gout? Warner is fairly clear on the point. He says that "irregular" or "misplaced" gout may affect the stomach and intestine, producing loss of appetite, indigestion, vomiting, colic, dysentery, diarrhea and sometimes "gouty abscesses or imposthumes"; the head, in the form of vertigo, or apoplexy; the nerves, producing palsies, and the organs of respiration in the form of asthma, cough or phthisis. Walpole himself regarded gout as a great impersonator of other diseases. He writes, for instance, to Sir Horace Mann (August, 1785):

> Your philosophic account of yourself is worthy of you. Still, I am convinced you are better than you seem to think. A cough is vexatious, but in old persons is a great preservative. It is one of the forms in which the good appears, and exercises and clears the lungs. I know actually two persons, no chickens, who are always very ill if they have no annual cough. You may imagine that I have made observations in plenty on the gout: yes, yes, I know its ways and its jesuitic evasions. I beg its

> pardon, it is a better soul than it appears to be; it is we that misuse it: if it does not appear with all its credentials, we take it for something else, and attempt to cure it. Being a remedy, and not a disease, it will not be cured; and it is better to let it have its way. If it is content to act the personage of a cough, pray humour it: it will prolong your life, if you do not contradict it and fling it somewhere else.

It may well be doubted whether many of the diseases and symptoms attributed to irregular gout were really due to that disease at all. None the less it is wise not to be too dogmatic for we are told by Warner, and other writers on gout agree with him, that "from the first appearance of these internal symptoms there is little or no gout in the extremities" but that they disappear at once "if weather or medicine restores a regular fit of the gout," and he says that "steel powders are the most effective remedy for expelling the disease from the organs to the extremities." If these observations are accurate, and we have no reason to doubt them, there may have been something in "misplaced gout" after all. Walpole, at least, was always afraid of driving it from the extremities to the internal organs by too active treatment and warns some of his correspondents of this danger. He recognized, too, the apparent power of gout to prevent the patient getting other ailments, and speaks of it in the letter just quoted as a "remedy and not a disease." General experience has endorsed this view.

INOCULATION

Although gout is the disease most often spoken of in the Letters there are references to some others. Smallpox, that scourge of the century, naturally comes in for notice. Inoculation for it became fashionable in 1720 and Walpole was inoculated himself at the age of seven. Throughout his life he remained a strong advocate for the method and much as he disliked Lady Mary Wortley Montagu he has the magnanimity to speak of her "as a universal benefactress" for her introduction of it. He was never tired of defending it and in a letter to Mann in 1783 he expresses "his zeal for the cause of inoculation" and denies that Prince Octavius died from it. Some years earlier (1767) he had written to the same correspondent:

> I wonder all the Princes of Europe are not frightened *into* their wits—why, they die every day! and might avoid it, most of them, by being inoculated. Mr. Sutton* would insure them at twelve-pence a head. He inoculates whole counties and it does not cause the least interruption to their business. They work in the fields, or go up to their middles in water as usual. It is silly to die of such an old fashioned distemper!

But there were occasional disasters and in March, 1775 we find him writing: "The Duke of Gloucester had lost his second daughter; both were inoculated, that he might carry them abroad. The youngest was very unhealthy, and died the next day after the disorder disappeared."

In the main, however, he was no doubt justified in what he says to Lady Ossory: " . . . inoculation now can scarce be called a hazard. It is sure as a cheat of winning, though a strange run of luck may once in two thousand times disappoint him."

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* Robert Sutton, an operator in Kent. He charged 5 guineas for each inoculation and boasted that he had only had one accident out of the many hundreds of cases he had had under his care.

Epidemics

The eighteenth century did not escape visitations of influenza which seem to have recurred about every twenty years, for in March, 1743 Walpole writes to Mann:

> We have had loads of sunshine all the winter; and within these ten days nothing but snows, north east winds and blue plagues. The last ships have brought over all your epidemic distempers: not a family in London has escaped under five or six ill: many people have been forced to hire new labourers. Guernier, the apothecary took two new apothecaries, and yet could not drug all his patients. It is a cold and fever. I had one of the worst and was blooded on Saturday and Sunday but it is quite gone: my father was blooded last night: his is but slight. The physicians say that there has been nothing like it since the year thirty three and then not so bad: in short, our army abroad would shudder to see what streams of blood have been let out! Nobody has died of it, but old Mr. Eyres of Chelsea through obstinacy of not bleeding; and his ancient Grace of York.

There seems to have been another but milder epidemic in 1762, for in June of that year he again writes:

> The King had one of the last of these strange and universally epidemic colds, which, however, have seldom been fatal: he had a violent cough and oppression on the breast which he concealed just as I had; but my life was of no consequence, and having no physicians in ordinary, I was cured in four nights by James's Powders, without bleeding. The King was blooded seven times and had three blisters.

The disease reappeared twenty years later and once more we find him describing it to the faithful Mann (June, 1782):

> Since the naval triumph in the West Indies, I have had no public event to send you, nor anything else but journals of the epidemic disorder, which has been so universal and so little fatal, that a dozen names would comprise all I know who have escaped it, or died of it. The strangest part of it is, that, though of very short duration, it has left a weakness or lassitude, of which people find it very difficult to recover. One has had nothing to do but send messages of inquiry after all one's acquaintance; and yet, no servants to send on those messages. The theatres were shut up, the Birth-day (4th June) empty, and the Ball to-night a solitude. My codicil of gout confined me three weeks. I came hither to-day to air myself, though still very lame, and it is so cold that I am writing close to the fire.

There is a familiar ring about these descriptions which shows that influenza has not changed its essential character through the centuries.

In 1743 Walpole mentions that quarantine had been established for plague which had appeared first in Sicily, and two years later he writes to Mann apropos of the same subject: "Don't you remember a report of the plague's being in the City, and everybody went to the house where it was to see it." He than adds the comment, probably as true today as it was then, "'Tis our characteristic to take dangers for sights and evils for curiosities."

The nature of some of the other epidemics mentioned in the Letters is not so easily identified. What, for instance, was this? He writes to Mann in March, 1748:

> I have had nothing lately to tell you, but illnesses and distempers; there is what they call a miliary fever raging,

> which has taken off a great many people. It was scarce known till within these seven or eight years, but apparently increases every spring and autumn. They don't know how to treat it but think they have discovered that bleeding is bad for it. The young Duke of Bridgewater is dead of it.

The following description (January, 1760), on the other hand, almost certainly refers to diphtheria:

> There is a horrid scene of distress in the family of Cavendish; the Duke's sister, Lady Besborough, died this morning of the same fever and sore throat of which she lost four children four years ago. It looks as if it was a plague fixed in the walls of their house: it broke out again among their servants, and carried off two, a year and a half after the children. About ten days ago Lord Besborough was seized with it, and escaped with difficulty: then the eldest daughter had it, though slightly: my lady, attending them, is dead of it in three days. It is the same sore throat which carried off Mr. Pelham's two only sons, two daughters, and a daughter of the Duke of Rutland, at once. The physicians, I think, don't know what to make of it.

NERVES

"Nerves" seem to have been a pretty common trouble amongst fashionable people in Walpole's day, just as they are now. Thus he writes to Mann (May, 1780):

> I am grieved to hear you complain of your nerves, and know how to pity you. My own are so shattered that the sudden clapping of a door makes me tremble for some minutes. I should think sea-bathing might be of use to you. I know, though I have neglected it myself, that the sea air, even for four and twenty hours, is incredibly strengthening.

And towards the end of his life (1794) he complains to Lady Ossory of palpitations:

> I have of late years been subject to great palpitations, and they come more frequently and last longer. The wise in life and death insist they are only nervous; however I was seized with one on Saturday night, which continued so stormy that at four in the morning I was forced to send a man and horse to Twickenham for the apothecary, having such acute pain in my breast with it, that I concluded it the gout, and a warrant for me. Before he could arrive I had a slight vomiting, fell asleep for four hours—and am here still!

ILLNESSES OF EMINENT PERSONS

Being an inveterate gossip Walpole has naturally something to tell his correspondents about the illnesses of various prominent people of his time. In a letter of 1767 we find him expressing the rather rash opinion that "Lord Chatham's state is, too clearly, the gout flown up into his head," and again, on the same subject:

> But there is a misfortune not so easily to be surmounted, the state of Lord Chatham's health, who now does not only not see the Ministers, but even does not receive letters. The world, on the report of the Opposition, believe his head disordered, and there is so far a kind of colour for this rumour, that he has lately taken Dr. Addington, a physician in vogue, who originally was a mad doctor. The truth I believe is, that Addington, who is a kind of empiric, has forbidden his doing the least business, though he lies out of town, and everybody sees him pass in his coach along the streets. His case, I should think, is a symptomatic fever, that ought to turn to gout; but Addington keeps him so low that the gout cannot make its effort. Lord Chatham's friends are much alarmed, and so

they say is Addington himself; yet, what is strange, he calls in no other help.

The following refers to the alleged suicide of Lord Clive (1774):

> Lord H. has just been here and told me the *manner* of Lord Clive's death. Whatever had happened it had flung him into convulsions, to which he was very subject. Dr. Fothergill gave him, as he had done on like occasions, a dose of laudanum, but the pain in his bowels was so violent that he asked for a second dose. Dr. Fothergill said, if he took another he would be dead in an hour. The moment Fothergill was gone, he swallowed another, for another it seems stood by him, and he is dead.

This description of the onset of insanity in his nephew, Lord Oxford, is curious (letter to Mann, February, 1773):

> If I change this subject from my own person, I must not go out of the family: I have a melancholy tale to tell you of another branch of it, my Lord Oxford. He had a cutaneous eruption. By advice of his *groom*, he rubbed his body all over with an ointment of sulphur and hellebore. This poison struck in the disease. By as bad advice as his groom's, I mean his own, he took a violent antimonial medicine, which sweated him immoderately; and then he came to town, went to Court, took James's pills, without telling him of the quack drops, sat up late, and, though ordered by James to keep at home, returned into the country the next day. The cold struck all his nostrums and ails into his head, and the consequence is—insanity!

Sometimes one is quite at a loss to identify the disease from his description of it. Take, for instance, his account of the last illness of his friend Mr. Chute (May, 1776):

> Mr. Chute for these last two or three years was much broken by his long and repeated shocks of gout, yet was amazingly well, considering that he had suffered by it from twenty to seventy-three! Still as he had never had it in his head or stomach, I never was alarmed till last summer, when he had a low lingering fever, and sickness and pain in his breast, with returns of an excessive palpitation at his heart, which formerly much alarmed me, but of which he had been free for some years. He got better and went to the Bath, which gave him the gout, and here turned quite well; so well, that, alarmed at our situation, he thought of drawing some money out of the Stocks and buying an annuity, saying, that he thought his life as good as any man's for five years. I am sure I thought so too. On Thursday last, being surprised at his not calling on me for three days, which was unusual, I went to him and was told that he was very ill. I found him in bed; he had so violent a pain in his breast that two days before he had sent for Dr. Thomas, whom he had consulted in the summer, though of all men the most averse to physicians. Thomas had given him an hundred drops of laudanum and asafoetida. Mr. Chute said, "*it is not the gout; I have had my palpitation, and fear it is something of a polypus.*" Thus, perfectly reasonable, though with much more indifference than he who was all spirit and eagerness used to have, I attributed it to the laudanum, and indeed he desired me to leave him, as he was heavy, and wanted to sleep. He dozed all that evening, and had no return of pain. On Friday morning, still without pain. I saw him again. He had taken more asafoetida, but no more laudanum; yet, when I said, I trusted the pain was gone, he said, "*I do not know; the effects of the laudanum are not yet gone.*" I said, I thought that impossible; that the pain would have surmounted the laudanum by that time, if the pain were not removed. I was coming hither on business, and charged his valet to send for me if the pain returned.

> On Saturday morning I rejoiced at not receiving even a letter by the post, and concluded all was well.
>
> This dream of satisfaction lasted all that day and Saturday night. I knew he would take no more laudanum, unless the pain returned, and that then I should be advertised. But, oh, unhappy! yesterday, just as I had breakfasted, and was in the garden, I heard the bell at the gate ring, and wondered, as it was but ten o'clock who would come to see me so early. I went to see, and met my valet-de-chambre, with a letter in his hand, who said, "*Oh, Sir, Mr. Chute is dead!*" In a word, he had continued quite easy till three that morning, when he said, "*Who is in the room?*" His own valet replied, "*I, Sir!*" and, going to the bed, found him very ill, ran to call help, and returning as quickly as possible, saw him dead! It was certainly a polypus; his side immediately grew as black as ink.

What was a polypus? And why should the side immediately grow "black as ink"? We are left guessing.

PROMINENT MEDICAL MEN

There are few mentions of prominent members of the medical profession in the Letters, as was to be expected considering Walpole's prejudices, and such as there are have a rather malicious tone. He writes, for example, almost gleefully (July, 1750): "Dr. Mead is undone; his fine collection is going to be sold; he owes about £25,000. All the world thought him immensely rich; but, besides the expenses of his collections, he kept a table for which alone he is said to have allowed £70 a week."

As a matter of fact he was wrong in this for Mead's great collection was not sold till after his death when it realized a large sum.

In the following extract (November, 1780), the great John Hunter appears in the character of a politician:

> Dr. Hunter, that Scotch nightman, had the impudence t'other day, to pour out at his Anatomic lecture a more outrageous Smeltiad than Smelt himself, and imputed all our disgraces and ruin to the Opposition. Burke was present, and said he had heard of Political Arithmetic, but never before of Political Anatomy, yet for a Scot to dare thus in the heart of London, and be borne, is proof enough that the nation itself is lost beyond redemption.

A "nightman" presumably was a body snatcher and was just the sort of epithet that Walpole would apply to an eminent anatomist.

John Hunter's brother, William, also appears for a moment: "Two mornings ago they might have seen me receive, first Dr. Hunter, and a moment after, Lady Craven—a man-midwife and so pretty a woman are very creditable; and yet, alas! he came to talk to me about Greek medals. . . . "

And again Walpole must have his sneer of "man-midwife."

QUACKS

The eighteenth century was the Golden Age of quackery, and more eminent quacks are mentioned in the Letters than eminent doctors. Not that Walpole believed in quacks; on the whole he had as low an opinion of them as he had of medical men. "By quack," he says, "I mean impostor, not in opposition to but in common with physicians." His friends sometimes tried to persuade him to use quack remedies for his gout but he would have none of them. He replies to Sir Horace Mann, who had recommended the treatment of Le Fevre, a French charlatan:

> *Nov.* 1770. I am much obliged to you for the detail of Le Fevre's medicine; but I am perfectly recovered without it, and strong in opinion against it. I am persuaded that he is a quack, and his nostrum dangerous. He has been here and carried off five thousand pounds, at a hundred pounds per patient!* You must know, I do not believe the gout to be curable. There must have been longer experience of this new remedy's effects before I would try it upon myself. I have known many nostrums stop every cranny into which the gout is used to crowd itself, and the consequence has always been an explosion. I am not desperate, nor like the adage, *kill or cure*. But my great objection of all is, that the medicine begins with *giving* the gout. Thank it; I have not the disorder above once in two years, and it would be bad economy to bring on what I may never live to have.

Another "gout doctor" of the day was Buzaglo, a Jew who first attracted notice as an inventor of heating apparatus. He professed to cure gout by muscular exercise only, and advertised extensively. He is referred to in the following letter to Lady Ossory (December, 1777): "Crawford is again confined with the gout. . . . He has heard that Taaffe has been cured by Buzaglo and sent for the former, who told him fairly that Buzaglo had removed his gout in four hours but said the operation would kill any man less strong."

Sir Robert Walpole, Horace's father (or alleged father), though he did not suffer from gout was much afflicted in his later years with the kindred disorder, stone. He was treated for this by Mrs. Stephens' remedy on which Horace makes the shrewd comment contained in this extract from a letter to Mann:

> My father has been extremely ill this week with his disorder; I think the physicians are more and more persuaded that it is the stone in his bladder. He is taking a preparation of Mrs. Stephens's Medicine, a receipt of one Dr. Jurin, which we began to fear was too violent for him: I made his doctor angry with me by arguing on this medicine which I never could comprehend. It is of so great violence, that it is to split a stone when it arrives at it, and yet it is to do no damage to all the tender intestines through which it must first pass.

Johanna Stephens, it may be remembered, was a lady who in 1736 announced that she had discovered a cure for calculus and two years later she offered the formula to the public for £5000. Astonishingly enough Parliament paid her this sum on the advice of a committee of which Stephen Hales, Cheselden and Hawkins were members (all of whom ought to have known better) and the "secret" was published in the *London Gazette* in 1739. The remedy proved to be chiefly composed of calcined egg shells, snails and a decoction of soap. She had indeed sold the Country a "pup." It is said that Sir Robert Walpole by using the "cure" had consumed in the course of several years at least 180 lbs. of soap and 1200 gallons of lime water. Yet he was attended by some of the best lithotomists of the day and after his death three large stones were found in the bladder.

In 1789 Walpole writes: "Loutherbourg, the painter, is turned as inspired physician and has 3000 patients. His sovereign panacea is barley water

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* His medicine proved extremely noxious (Walpole).

I believe it as efficacious as mesmerism." This Loutherbourg was a faith-healer. He was born in Germany in 1740 but came to England at the age of thirty and made some name as a painter, being elected a member of the Royal Academy in 1781. He was scene painter to Garrick at Drury Lane and also produced several large marine pieces, one of which, depicting Howe's Victory of June 1, 1794, now hangs in Greenwich Hospital. Loutherbourg in the later part of his life settled at Chiswick and took up the study of the occult. He became convinced that he and his wife were gifted with the power of healing and for a time had a large number of adherents.

Another obscure quack named Thompson, about whom there is nothing to be discovered, figured in the tragedy of the death of Mr. Winnington, "one of the finest men in England," described in a letter to Mann (1746):

> He was not quite 50, extremely temperate and regular and of a constitution remarkably strong, hale and healthy. A little above a fortnight ago he was seized with an inflammatory rheumatism, a common and known case, dangerous, but scarce ever known to be fatal. He had a strong aversion to all physicians and lately had put himself into the hands of one Thompson, a quack, whose foundation of method could not be guessed, but by a general contradiction to all received practice. . . . This ignorant wretch soon made such progress in fatal absurdities, as purging, bleeding and starving him, and checking all perspiration that his friends Mr. Fox, and Sir Chas. Williams absolutely insisted on calling in a physician. Whom could they call but Dr. Broxholme an intimate old friend of Mr. Winnington and to whose house he always went once a year. This doctor, grown paralytic and indolent, gave in to everything the quack advised . . . At last, which *at last* came very speedily, they had reduced him to a total dissolution by a diabetes and a thrush; his friends all the time distracted for him, but hindered from assisting him, so far that the night before he died. Thompson gave him another purge though he could not get it all down. Mr. Fox by force brought Dr. Hulse, but it was too late. . . .

It is curious to think that in these days regular doctors were apparently quite ready to meet quacks in consultation and to adopt their treatment. This appears not merely from the foregoing extract but from other statements in the Letters. Professional etiquette was apparently not so strict in this respect then as it is now.

Tar water, although perhaps it can hardly be described as a quack remedy, was all the rage in the middle of the century, and Walpole, of course, mentions it in a letter to Mann (1744) telling him how popular it was:

> We are now mad about tar water on the publication of a book by Dr. Berkeley, Bishop of Cloyne. The book contains every subject from tar water to the Trinity; however, all the women read and understand it no more than they would if it were unintelligible. A man came into an apothecary's shop the other day, "Do you sell tar-water?" "Tar-water," replied the apothecary, "Why, I sell nothing else."

But just as Walpole believed in one physician, Dr. James, and his powder, so he believed in one quack, the notorious Joshua Ward, and his "drops," and it is interesting to remember that the basis both of James's powder and Ward's drops was antimony. He did not hesitate to recommend Ward to his friends as is shown by his writing to Mann (March, 1760):

> I wish you had given me any account of your headaches that I could show to Ward. He will no more comprehend *nervous* than the physicians do who use the word. Send me an exact description; if he can do you no good at least it will be a satisfaction to me to have consulted him. . . .

In another letter (April, 1761) he deplores to Montagu that Ward was not called in to a serious case:

> Poor Lord Edgecombe is still alive, and may be so for some days; the physicians, who no longer ago than Friday se'enight persisted he had no dropsy in order to prevent his having Ward, on Monday last proposed that Ward should be called in . . . and at night they owned they thought the mortification begun—it is not clear it is yet. . . . What parts, genius, and agreeableness thrown away . . . and not permitted the chance of being saved by the villainy of physicians.

None the less, compared with other members of the eighteenth century society set or even, it may be said, with the same class today, Walpole was singlarly free from a belief in quackery.

Obiter Dicta

Scattered throughout the Letters are some casual remarks and *obiter dicta* of medical interest. Here are some of them:

> I . . . cannot believe in the contagion of consumptions. . . . Were it catching, it would be still more common here than it is. [A wrong opinion, as time has shown.]
>
> . . . A cough, though a vexatious remedy, is a preservative of elderly persons, from exercising and clearing the heart and lungs. I know two or three who for years have had a constant cough in winter, and who have dangerous illnesses if it does not return in its season. [An interesting observation if correct.]

He writes to the Rev. W. Mason:

> You do not mention Gray's study of physic, of which he had read much, and I doubt to his hurt. [The poet is not the only layman, it is to be feared, who has studied physic "to his hurt."]

He says of his own constitution that it is "like grass that escapes the scythe by being low," that "bark makes him sleep like opium" but "it is difficult to get it good" and that sleep is his great restorative, "no dormouse beats me." He sends his friend Mr. George Montagu a recipe for preserving the teeth which might be worth trying today; it is at least simpler and less expensive than some modern preventives of caries:

> Use a bit of alum twice or thrice in a week, no bigger than half your nail, till it has all dissolved in your mouth, and then spit it out. This has fortified my teeth that they are as strong as the pen of Junius. I learned it of Mrs. Grosvenor that had not a speck in her teeth to her death.

Finally we may take two sayings worthy of Dr. Johnson himself: "London agrees with me better than the country," and "Nothing is so troublesome as to talk of chronical complaints," and yet he said he could talk gout by the hour!

Even allowing for Walpole's prejudices the impression of eighteenth century medicine conveyed by the Letters is a melancholy one. What with the absence of anesthetics, antiseptics, morphia and skilled nursing and with pompous and ignorant physicians, bleeding, blistering, purging and prescribing gallons of nauseous drugs every illness must have been a nightmare. No wonder the arch-cynic of the century stigmatized the art of medicine as being like the art of war—"both murderous and conjectural."

JOHANN PETER FRANK AND HIS "SYSTEM EINER VOLLSTÄNDIGEN MEDICINISCHEN POLIZEY"

By LEONA BAUMGARTNER, PH.D. AND
ELIZABETH MAPELSDEN RAMSEY, M.D.

NEW HAVEN, CONN.

(*Conclusion**)

By various of his admiring biographers[1,4,14] Frank has been called "The Father of Public Health." At the outset we would wish first to limit and then to vindicate his right to the title. It would, of course, be entirely false to imply that before his time nothing had been done to protect the health of the community. From earliest times common sense and experience had dictated and religious or civil ordinance commanded the observance of crude isolation precautions; human sympathy had prompted the founding of hospitals, homes for orphans, the aged and the afflicted; decency and aesthetic perception had made elementary attempts toward sewage and garbage disposal; all of which comes within the scope of the modern conception of public health. Frank himself not only cites with due admiration many laws and tracts which suggested ways and means of improving health, but in the last volume of his "Medicinische Polizey" he attempts to list all such works (VI). Each of these documents, however, concerned itself with a more or less limited field, so that it is permissible to think that Frank was the author of the first comprehensive treatise. In addition to this justification of his title upon a basis merely of definition, one pregnant sentence in the Preface to his great work introduces into the whole subject of health and the community a new and vitally important note: "At present the authorities give themselves more trouble and spend more money in one week in fruitless attempts to apply remedies than would ever be necessary if effort and money were expended *to prevent evils through wise ordinances*" (I, p. ix). These six words are the kernel of Frank's thought on the subject of public health. They also form the vitally important innovation which is his claim to his position as father of modern hygiene. The idea of prevention was of course not new. Charms to ward off evils, among them sickness and death, were chanted long before the dawn of history. Herbs and salves and potions were used as a preventive against specific ailments with varying degrees of appropriateness. But to the idea of intelligent prevention on a large scale Frank added those significant words "by wise ordinances."

Born of one individual's thought the concept has grown mightily, embodied in our day in such diverse institutions as pure food laws, compulsory registration of births and deaths, enforced isolation of scarlet fever patients, and state medicine in Russia. Like most great ideas which have rapidly taken hold of the world, this one has flourished not because of its originator, but because it was inherently valid and important and because it was deeply needed and men's minds were prepared to receive it. Prefaced by earnest attempts at control of disease, the transition to the concept of prevention was relatively easy. Furthermore, as Professor Sigerist[25] and Schmidtz[22] have pointed out, the idea of benevolent despotism which pervaded European political and social thought in the early nineteenth century furnished an intellectual sanction for the project. Sovereigns had become convinced that it was their duty to care for their subjects as fathers for their children and to force upon them all measures which they believed to be for their best interests. It remained for Frank to point out that this duty embraced questions of disease prevention as well as those of social relationships. With this avowed purpose he wrote his "Medicinische Polizey," remarking in the Preface:

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* Part I of this article appeared in the November, 1933, issue of the ANNALS, n. s. vol. 5, p. 525.

> I have long considered the inaction (on matters of public health) of so many men of the first rank. It is with reluctance that I accuse those who, in the interest of their fatherland lie awake through so many nights, of this thoughtless negligence. And I have said to myself: The pressure of their other work leaves them no opportunity even to begin to investigate the complaints which the physicians bring them concerning a field which is utterly foreign to them. The physicians indeed complain to one another in their books about the miserable condition of the general health situation, but the mere title of a medical book makes for its being read by physicians alone, and physicians can do little or nothing to abolish evil practices. [1, p. x.]

It thus became clear to Frank that what was needed was a book which should bring to the attention of those individuals actually possessing the power to abolish abuses the facts of the health situation in language which was intelligible to them. To fill this need he wrote his six volumes of the "Medicinische Polizey" in the vernacular, adding to a mere outline of existing health conditions his own opinions as to what laws and regulations should be instituted to do away with evils and prevent their recurrence.

As a nation which has deeply and painfully experienced the impossibility of changing people's customs and morals by the passage of laws, we may not be able to suppress a smile at Frank's naive enthusiasm for the "polizey" portion of his system. His faith in the advisability and feasibility of legislation was as unbounded as idealistic. If careful medical investigation showed that the current mode in women's clothing prevented attainment of the optimum depth of respiration, a law should be passed prohibiting the wearing of clothes of that cut, and women would once more obtain their proper quota of air. Laws were simply the magic wand which transformed theories into actualities. The only stipulation was that the theory must relate to something which would further the good of the people, but if it did so, and certainly bettered health met this requirement, then there could be no possible objection to waving the wand. In fact the oftener it was waved and proposed improvements became actualities, so much the better. Such a belief betokens either deep ignorance of human nature or a complete disregard of the personal equation. Frank never troubled himself with the thought that instincts of sturdy independence might incite the public to rebellion against the tyranny of laws thrust upon them as if they were mere slaves. It never seems to have occurred to him that health education might be necessary before the public could be expected to respect and observe his laws. And so almost no page of the "Medicinische Polizey" is without some such expression as "it must be prohibited by law," "the police should enforce," "on pain of severe penalty," "an important object for the attention of the police." Literally everything, from the age at which children might first be taught to read to the type of kettles in which their mothers might stew a chicken, was to be regulated by law and these laws enforced by the proper officials. Here once more in particularly extreme form is the philosophy of the benevolent despot coupled with that passion for organization which has been looked upon by other European nations as particularly German.

As the brief summary of his life abundantly demonstrates, Frank's intellectual energy relished any attack upon huge problems and in undertaking this, his favorite subject, he resolved upon the most exhaustive thoroughness of treatment. He not only determined to study every aspect of contemporary life as it related to the most minute details of communal and personal health, but he shirked no arduous historical research which might throw light upon the origin of the customs and practices which he observed. Thus a cursory glance at the table of contents of the volumes shows him dealing with problems of population increase, expectation of life, health of school children as affected by the height of the school benches, celibacy of soldiers, contamination of wine and beer by storage in improper casks, cleanliness of homes, suitable clothing for pregnant women, spread of infectious diseases by traveling players, accidents occasioned by earthquake, wild beasts and hazardous sports, the danger of burial alive, and the optimum depth for graves, in a word the entire progress of man "from the womb to the tomb." Totally aside from the purpose which Frank strove to accomplish in his own time, succeeding generations find in his work a sociological document of exceptional value, a veritable mine of information regarding the way in which daily life was conducted in the late eighteenth century. On the other hand, with his easy command of Latin, Greek, German, French, English, Italian and Dutch, Frank was able to scour the archives of history, medicine, travel and philosophy for a background for his study of contemporary life; so that, on thumbing the pages and glancing at the footnotes, one happens by chance upon references to sources as diverse as a history of folk customs of the Slave Coast of Africa, edicts of the second Synod of Turonica regarding marriage of the clergy, Montesquieu's "Lettres Persannes," G. Jo. Petr. Haas' report upon the harmfulness of the bites of various European vipers, Tacitus' description of salt mines in early Germany, expenditure records relative to the cost of aqueducts built in imperial Rome, ordinances of the Egyptians regarding methods of determination of death. To prove the intensity as well as the diversity of the research one may cite the fact that of the 40 pages (1, pp. 139–179) devoted to a study of the celibacy of the clergy 24 deal with an historical survey of the ideal of celibacy for servants of Deity in the course of which 52 footnotes refer the reader to as many sources from which Frank derives authority for his statements. These references are used to establish authority for data and specific facts rather than as appeals for sanction of his own deductions. Throughout the six volumes there is a minimal use of references in the latter sense, and when it does occur it is almost without exception to the work of his contemporaries. This is, of course, entirely in line with the progressive and scientific attitude which characterized Frank's work in other fields.

To play the rôle of reviewer to such a work is in itself no simple task, especially when a century and a half have elapsed since it was published so that the historical must be added to the purely critical function. As a point of approach to such a review and as a method of making Frank's observations and theories more easily comparable with those of our time, it has seemed wise to group the material in accordance with the divisions of public health in use in modern practice rather than in the purely chronological, cradle to grave, order which Frank himself employed. By a little judicious stretching of the categories almost all of the substance of the "Medicinische Polizey" may be fitted into seven groups which correspond to those into which public health work is usually divided.

VITAL STATISTICS

The opening chapters of the "Medicinische Polizey" deal with a subject which was one of the favorite considerations of the eighteenth and nineteenth century political and social philosophers, the problem of population. Frank's conclusions as to the effects upon the population, its health and its fertility, of war, deforestation, industrial versus agricultural occupations, emigration and immigration, city dwelling and increased luxury show both a close familiarity with the writings of Voltaire and Rousseau and a fervent agreement with them and with the spirit which was to culminate in the works of Mill and Malthus. But within the first few pages a note more scientific than purely philosophical is struck when he bewails the impossibility of making conclusive statements of any kind about population because of the inaccuracy and unreliability of the vital statistics of the day. One remembers that Frank is writing for a generation of lay readers to whom the scientific method was all but unknown as one finds page after page devoted to an eager exposition of the use and value of vital statistics. There is perhaps no more modern touch in all of the "Medicinische Polizey" than the suggestion that the officials, in addition to enforcing promptitude and accuracy in registration of births and deaths, appoint commissions to make surveys of the amount of poverty and the prevalence and geographical distribution of various diseases in given districts and correlate these together with morbidity and mortality rates into statistical charts. His ideal was that these charts should be used both as a means of instituting measures for the betterment of conditions and as a means of studying more intensively the characteristics of individual diseases.

MARITAL HYGIENE

It is perhaps being a little more modern than the moderns to say that present-day public health organization includes an actual department of marital hygiene, but more and more work is being done along these lines. The category is useful in our present consideration, for Frank has a great deal to say upon the subject of marriage (I, i & ii). Beginning with an anatomical, physiological and psychological discussion of the procreative instinct, he progresses to a medical investigation of the pros and cons of celibacy. The most enlightened minds of 1779 held many views upon both these subjects which seem almost medieval today. But one feels in reading this portion of the "Medicinische Polizey" that Frank was motivated almost as much by his desire for an increase in the number of citizens for the Vaterland as by his belief in the harmful effects of continence upon the individual. But it is no mere gross increase in birth rate which he seeks. He calls upon all the dictates of religion and common sense to support him in asserting that serious consideration should be devoted to the founding of a family, even going so far as to advocate the establishment of a law prohibiting parents from having more children than they can bring up as desirable citizens. The sound principle that only persons capable in mind and body of fulfilling the ideals of parenthood should be allowed to assume that status he carries out into its furthest ramifications. After discussing in detail (I, ii) the circumstances which might prevent the fulfillment of these ideals: inequality in the ages of husband and wife, physical or mental immaturity of either, consanguinity, lack of mutual affection, insufficiency of financial means, above all wasting or hereditary disease, he states: " . . . it is therefore a distinct duty of the officials of the community to allow no one among their subjects who is afflicted with severely disadvantageous or hereditary disease to marry without being subjected to a thorough examination" (I, p. 316). On the other hand where no obstacles to the satisfactory fulfillment of the marital relationship or parenthood exist, the officials must look upon it as an equally sacred duty to promote marriage. Sixteen is to be considered the ideal age for women to marry and twenty-five for men. Bachelors above the age of thirty-six are to be taxed. The training of daughters is to be officially inspected as regards their household ability, occupations, amusements, proper chaperonage, clothes, all of these being regulated to the end of making the best possible wives. Arrangements are to be made whereby eligible girls and men in isolated communities shall be provided with suitable mates. Marriage contracts negotiated by families for social prestige or financial advantage are to be discouraged unless the young people are suited to one another and the marriage bids fair to be permanent. Love affairs, as predisposing to happy homes and the best sort of children, are to be championed by the authorities against all family objections. Actually a policeman is to be detailed to see that Romeo and Juliet are united in each other's arms! The most progressive of all his suggestions is that the proper officials are to see that neither the husband nor the wife enters the marital status without having received sufficient sex education. Thus, his ideal is fundamentally modern, though at times it may seem to be masked by the almost inexhaustible list of meticulous suggestions. It is not difficult, however, to see why he has been given a place in the history of the founding of social hygiene and eugenics.[13,23]

In view of Frank's belief that both for the sake of the individual's health and the good of the state everyone physically and mentally healthy should marry, it is not surprising to find that he directs considerable attention to that large body of individuals devoted to the ideals of celibacy, the clergy—priests, monks and nuns. His remarks upon this subject, though he is obviously deeply sincere in his reiterated assertion that he wishes to say nothing to offend the Church of which he was a devout member, called forth the most heated criticism. In essence his thesis is that the majority of men and women are physically and temperamentally unsuited to a life of chastity and that a high percentage of those individuals who assume such a vow are too young and too inexperienced at the time when they do so to realize the full implication of their act. The result, he maintains, is great unhappiness on the part of many individuals who later regret their vows and are unable worthily to serve the Church because of their inner conflict, and, of course, a further result is a great loss of good parents to the state. He proposes to the authorities of the Church the more careful examination of candidates for religious orders to determine their true temperament, the establishing of a minimum age for the taking of vows, preferably in the late twenties, and the requiring of at least two years' experience in the world immediately before any individual expresses the intention of becoming a candidate for orders. Radical as were these ideas they were not entirely unique, similar suggestions having already come even from within the Church. What probably appeared to the clergy as most intolerable was the cold-blooded fashion in which Frank developed the history of the concept of celibacy of clerics through the ages. His first statement that the Early Church required its priests to be unmarried because of practical considerations, uncertain income, prolonged missionary journeys, the danger of persecution making stable homelife impossible, he tempered by stating that, of course, the Fathers had also in mind the higher ideal that its priests should offer the sacrifices of the Church with bodies "unspotted by the world." But having offered this sop he proceeds to make matters worse than ever by tracing back into earliest times among savage tribes the idea, for which he says no scientific justification can be found, that sexual activity constitutes a defilement. The almost condescending way in which he shows the historical and psychological relationship between the ideal of chastity of the Church and the superstitions of uncivilized tribes may well have been the most annoying feature of his discussion. One sees Frank rather naively transported so far by his scientific and humanitarian enthusiasm as to be totally oblivious of all considerations of tact and respect for points of view opposed to his own, and for a moment one has a flash of insight into why he may have been a difficult colleague and why quarrels arose among the members of the faculty in Pavia and Vienna.

INFANT AND MATERNAL WELFARE

It follows as a logical consequence of his theories of population and marriage that Frank should regard motherhood as a most sacred state, worthy of the greatest reverence and entitled to unlimited privileges. The school of thought on this subject to which Frank belongs has had no more revealing expression of its basic opinion than Frank's statement, "An expectant mother should not be looked upon as the wife of an individual citizen but as the hope of the state" (1, p.

533). Anthropologists, sociologists and eugenists of our day all stand behind this statement and would uphold Frank's banner. Whether any of them would go quite as far as he did in advocating state regulation of all the activities of women during pregnancy is questionable. His measures smack a little too much of factory regulations aimed at turning out a uniformly high class product to suit modern individualistic tastes. On the other hand his basic idea was so scientific that one experiences a shock of surprise in coming upon serious consideration of many current beliefs and superstitions which would seem more in place in old wives' tales than in juxtaposition to Frank's other views. Thus he deals at length with the evil effects upon the child of its mother's being frightened in the street by the sight of a negro or an epileptic, being excited by reading novels of adventure, or depressed by the sound of bells tolling for the dead. There is detailed discussion of the harm which the mother may sustain and transmit to her child from riding in fast carriages, climbing stairs, attending over-long Church services, indulging in inappropriate or excessive eating, drinking and frivolity, wearing improper clothing, doing too much work or enjoying too much idleness. Not content with pointing out the effect of such influences, Frank insists that it is the inalienable right of pregnant women to be protected from them and the obvious duty of the state to assume the role of protector through the passage of many and specific laws. His lifelong activity in the field of midwifery reform is reflected in his dicta upon the obstetrical regulations which the state should enforce. All labors must be attended. Ideally the midwife should be consulted before the expected date of confinement so that she may summon a physician to help her with the delivery if there be reason to anticipate complications. What obstetrical conditions midwives should not be allowed to handle are specifically listed, as well as the training which they should receive to enable them properly to perform the services actually within their scope. The equipment they should carry, the personal cleanliness they should observe, the bedside manner they should assume, all are clearly elaborated and municipal regulations to enforce these reforms are outlined. Into the hands of the midwives is given the important duty of tending the newborn infant during its first hours of life: stimulating respiration, tying and dressing the cord, summoning a surgeon to attend to any birth injuries which may have been sustained, bathing and clothing the child, and warning the mother against smothering it beneath the bed clothes or by lying upon it in her sleep. Legislation is proposed which should enforce bed rest for a reasonable time during the puerperium and exempt the new mother from housework or work in the fields for several weeks and from occupations which would interfere with due care for her child throughout its period of complete dependence.

When it comes to a discussion of illegitimacy (II, i), Frank admits that he feels himself to be between two fires. It is his first instinct to say that the child of an unmarried mother is as much a citizen as any other and of as great potential value to the state, so that its mother during her pregnancy and the infant itself are entitled to the same protection and care which would be theirs if circumstances were different. But on the other hand if too much kindness is shown one of the most powerful checks upon the spread of vice is removed. By and large, however, he feels that the greater evil lies in the neglect of unmarried pregnant women; criminal abortion, miscarriages, deformed and unhealthy children, and infant and maternal mortality being the price which the state must pay for disregarding this group among its subjects. The spread of vice he prefers to control first by discovering and facing the actual facts of the situation, and then by instituting stringent investigation and regulation of houses of prostitution. The best way of all, he maintains, is by increasing the opportunities for settled married life and insisting that the opportunities be accepted. Upon the subject of legalized prostitution, though he devotes many pages to a discussion of it, Frank makes no definite statement. It is impossible to determine whether he is unable to make up his own mind about the question or whether because of some ulterior consideration he wishes not to commit himself.

To deal with the multitudinous details of the maternal and infant welfare program which he has outlined, of which space has permitted only the barest outline here, Frank suggests the establishment of an office in each municipality where it is to be required by law that all pregnancies, legitimate and illegitimate, be registered, and where "follow up records" be maintained.

Child Welfare

It was not until the work of the British school in the early 1800's that pediatrics attained individual identity as a medical specialty. The situation in the late eighteenth century as described by Frank (II, ii) had changed little since the Dark Ages. Because medical schools placed no stress in their curricula upon the diseases of children and individual practitioners paid almost no attention to this difficult field, the care of sick children had become quite exclusively the concern of the old women of the community. Despite the undoubted advantage of long and practical experience in motherhood, their methods had become so confused and involved by a blind adherence to tradition and superstition as to be little more than a practice of magic. And also the high rate of infant mortality had brought about an almost fatalistic state of mind in the people. If a young child fell ill, the statistical probability of its recovery was so slim that for the most part its life was despaired of from the first and little attempt was made to save it. Far more faith was placed in the application of miracle-working herbs and in the wearing of holy medals than in a truly medical approach to the disease. Frank feels that it is futile to attempt to forbid lay women to undertake the care of sick children until the medical schools have created a department for the study of children's diseases as entities separate from adult illnesses, and have trained a generation of physicians skilled in the specialty.

In view of the title of his doctor's thesis it is interesting to see what Frank thinks is an ideal diet for a child. Ninety-four pages in this section are devoted to a plea that mothers nurse their children. The advantages and disadvantages to mother and child of breast feeding are gone into with his usual thoroughness. His conclusion is, of course, the proposal of a law, this one to read that only mothers suffering from some transmittable disease (consumption or syphilis mainly) may be exempted from nursing their children for at least nine months, or, if another pregnancy should intervene, until the fifth month of the new pregnancy. When children are finally weaned, and Frank advocates that mothers be encouraged to nurse them for another nine months after the expiration of the legal period, they are to be given soft food, "pap" made of various cereals, or zwieback and milk, until a full diet is instituted at three years.

Perceiving that death or disease may prevent breast feeding by the mother and grudgingly accepting the fact that women of the higher class in his time refused to be burdened with the nursing of their own children, Frank grants that wet nurses may have to be substituted. Feeding with animal's milk is acceptable only in emergencies as it is too frequently the source whence children contract diseases common among animals. The proper selection of wet nurses involved a multitude of considerations which apparently formed a most trying problem for eighteenth century parents. Frank believes that the best possible way of dealing with the problem would be by copying the organization which had been recently developed in Paris. He quotes verbatim the thirty-five articles of the charter of this new foundation. Women eligible for the position are to report to a central office which will examine all their qualifications (including chemical analysis of their milk) and if they are approved they are assigned infants from families which have also applied at the office and been subjected in their turn to investigations. It being the consensus of opinion of his time that it was more satisfactory to board infants with their nurses than to have the nurses leave their homes to enter the household of their employers, Frank perceives the necessity of having frequent inspection of their health and that of their families, the conduct of their homes, and the treatment they accord their charges. This duty he confides to the same authorities who are in charge of the central bureau, stressing specifically that the visits of inspection must be made at regular intervals without "waiting for ill health to develop" (II, p. 435). One sees an analogy between this provision and our own "well baby clinics."

Frank's further discussion of child welfare deals with the pre-school and the school child. He cautions against allowing children to walk too soon, disapproves of the use of walking boards and chairs, and advises judicious lightening of the discipline of sickly children. He points out the care with which parents and nursemaids must guard their charges against the accidents into which high spirits may precipitate them, against falling from haylofts, being bitten by their pets, overindulging in Christmas cakes and Easter eggs in the icing of which artificial coloring matter has been used. He sounds very like many modern psychiatrists in his criticism of parents who tell their children that the Easter Rabbit lays the eggs and that St. Nicholas brings the cakes, and in his warning against allowing nurses to fill the children's minds with tales of evil spirits, "bogeymen," or robbers since "these stories and terrifying images rouse the imagination into a harmful excitement and leave upon it impressions which can hardly be rooted out in the course of a life-time. And in a hundred circumstances where a certain fearlessness will be needed old sensations of terror and trembling will be awakened despite all the counsels of reason" (II, p. 244).

His discussion of clothing and amusements (III, iii, 1 and 2) may be taken as a part of the general consideration of health of young people. His customary detailed analysis of underlying health aspects as well as suggestions in regard to legislation is included in these considerations, and his proposals are as theoretically sound and as radical in their encroachment upon individual rights as usual.

As for school, it must not be begun too early and must never be made too strenuous (II, iii, 2). Outdoor life and healthy noise and activity are far too beneficial for growing young humans to be sacrificed to too many hours cramped over a desk in a stuffy room with attention forcibly riveted upon books and sums. All the regulations which he says the state must institute are designed as checks upon those influences which would tend to force this sacrifice. Children should not be sent to school before they are eight years old, the younger ones must not be required to spend more than four hours a day at their lessons, the surroundings must be planned with an eye to the best possible location of the building, size of the school rooms, light, ventilation, heating and cleanliness. Boys and girls should be segregated and where possible men and women teachers employed. All instructors should have a broad conception of the ideals of education, be individuals of kindness and sympathy who neither force backward scholars nor exploit brilliant ones. Punishments should be humane and home work minimal. Either the teacher himself or a properly trained assistant should organize and supervise extensive outdoor gymnastic programs. This latter point leads Frank into a discussion of sport in general (II, iii, 3) and into suggesting means whereby adults as well as children may participate in healthy athletic games and competitions. Each contemporary German sport from fencing and military drill to ballroom dancing and tree-climbing is described with a wealth of detail valuable from the historical standpoint. This portion of the "Medicinische Polizey," so very reminiscent of "Emile," once more shows Frank's full agreement with the spirit of his age.

The suggestions regarding the care of foundlings and orphans are very sane (II, ii, 4). The children are to be placed in foster homes whenever possible; it is even proposed that the state set apart a fund so that poor families may be reimbursed for taking in one of the state's charges. The foster homes, of course, are to be inspected as carefully as the homes of the wet nurses. The children are not to be brought up to expect luxury in their later lives, but the necessary rudiments of education and all the elements of morality and good living are to be inculcated and a trade is to be taught to each of the boys. The institutions in which the children are to be kept while foster homes are being found and during a preliminary quarantine period while they are being examined for evidences of constitutional or contagious disease are to be run under the supervision of intelligent and benevolent matrons and masters. Food, linen, sanitary arrangements, the discipline of the children and their amusements, their duties and their clothes are described. The health aspect of these institutions is given great emphasis as Frank is anxious to devise some means by which they can be freed from their reputation of being "next to the hospitals, the greatest breeding spots for disease" (II, p. 450).

INFECTIOUS DISEASE

Three hundred and fifty pages of the posthumous third supplementary volume of the "Medicinische Polizey" are largely devoted to the subject of infectious diseases, all divided into many small sections which Voigt has edited carefully and which Frank meant to expand into a vast tome. But apparently in this case he was unable to bring to a close his meticulous gathering of references and outlining of programs. The notes give little of Frank's personal opinions and are possibly of chief interest to the historian. They are, however, an enormous graveyard of bibliographical reference to the history of epidemiology, quarantines, isolation practices et cetera. The wealth of treasure to be unearthed in the footnote references in these sections is truly exciting. Plague, smallpox, yellow fever and cholera are discussed in great detail. The current miasmic theories are developed and evaluated. Evidence for the contagious nature of epidemic disease is presented. Predisposing factors to disease in the host are also reviewed. Programs for quarantine stations at international boundaries, in small villages and in individual homes are outlined. He bemoans the fact that even the many observations which had already been made had not revealed much concerning the origin of infection. He insists that the secret of the problem is not to be found in the wrath of God, in the stars, in bad air, nor in the irregularity of the seasons, as the source of contagious disease is a poison *sui generis* which is transmitted by viable and non-viable agents. He maintains it to be the "holy duty of officers of the state" to use those proved preventatives, the Jenner vaccination and belladonna (for scarlet fever) and not to "hold their hands in their laps" while millions of citizens are suffering (Supp. II, pp. 357-358). In fact he considers that "the failure of governments . . . in not seizing the only safest, most expedient method and taking a stand for compulsory vaccination is truly to be wondered at" (Supp. III, p. 535). He confidently looks forward to the day when all contagious disease shall be wiped from the face of the earth. The details of administration are not as numerous nor as meticulous as is customary when Frank plans programs, but all is cloaked with that Frankian love of systematization which made the "Polizey" possible and that dogmatic belief which supposes that well-formulated laws can solve any problem.

All these ideas are expressed in the idiom of an older conception of infection. But it is to be remembered that Frank wrote at a time when the work of Pasteur and Koch was still a century ahead. In 1779 the time for the experimental proof of a germ theory of disease was not yet ripe. A Semmelweis was still to read from the bedsides of the Krankenhaus the transfer of infection from the autopsy table to the delivery room. This story Frank missed although he had a rich opportunity for observing epidemics during his early years as a general practitioner in southern Germany, although he had a deep personal experience with puerperal sepsis in the death of his first wife and of the communicability of typhus in the death of his son, and although his first idea for the "Medicinische Polizey" was that it should furnish a means of controlling epidemics and plagues by specific prevention. But, primarily a capable clinician and administrator, he did not have it in him to anticipate the modern conception of the nature of infection. He was, however, able to grasp the essentials of the public health aspects of communicable disease and this approach to the subject was perhaps the best that could be expected of his time. The control of epidemic disease had long since forced itself to a place of prominence. From the time of the writing of the thirteenth chapter of Leviticus until Frank's day there had appeared many decrees attempting to control epidemics of bubonic plague or leprosy by means of isolation and quarantine so that this phase of public health was perhaps as well developed as it might be until the horizon of knowledge itself was extended.

Food Inspection

When it comes to questions of food inspection, medical education, sanitation and forensic medicine Frank is once more in his element. As his views are analysed it will be seen that modern practice has more nearly followed his suggestions in these fields than in the ones so far discussed. This may seem to be due to a number of different factors. Thus, problems of food inspection and sanitation are ones which lend themselves quite readily to public and legal control without infringement of personal rights, whereas problems of individual hygiene do not. The strict supervision of the height of women's heels or the prohibition of drinking cold water immediately after dancing are assuredly in a field in which official interference is impracticable. Again, certain other of Frank's suggestions, such as compulsory physical examination before marriage and restriction of the number of children in accordance with the financial means of the parents, may be said to have been disregarded by most public health organizations up to the present day because the underlying ideas are too advanced for public acceptance even yet.

In the section on food inspection (III, i, ii, iii) Frank's use of minutia reaches truly phenomenal proportions. He follows his usual plan by taking up general and historical considerations before proceeding to a study of contemporary usage. A full account of the battle which has raged for centuries between vegetarians and meat eaters is followed by an exposition of the verdict of eighteenth century science in the debate. A mixed diet is, of course, what Frank advocates, and it is interesting to note that he feels that his compatriots are stressing the meat courses in their menus too greatly. General considerations having been disposed of particulars are next taken up and each single item of diet is followed from its site of origin through each stage of its progress until it reaches the individual citizen's plate. The ideal circumstances under which animals should be raised and slaughtered are described, Frank's interest in the veterinary art revealing itself in his discussion of what animal diseases contraindicate the use of their meat as food. A similar treatment is accorded the subject of fish: shell fish, fresh and salt water fish, salted, dried, and pickled fish. An interesting touch here is a warning against consumption of fish caught in streams flowing past lead and copper factories. The danger of metallic poisoning is also pointed out in the discussion of storage of milk and butter. Cautions against the use of metal vessels for this purpose are issued and a quotation from "Dr. Franklin of Boston" is employed to add weight to his own opinions on the matter. The subject of vegetable foods involves not only a description of the agricultural methods which produce the best crops of grains, fruits and green vegetables, but also remarks upon how grain is most satisfactorily ground to flour (with emphasis upon the danger of mill stones flying off their axles and injuring innocent bystanders or workers in adjoining fields!), what sorts of bread are most healthful, and a debate as to whether Europeans eat too much bread altogether, this question being decided in the affirmative. Legislation is proposed to regulate most carefully wholesale and retail stores, markets and fairs in which food is sold so that in addition to being assured of fresh and healthful products the public may be sure of honest weights. No watered milk or butter mixed with lard or bread made half of flour and half of alum is to be tolerated. A chapter on spices condemns the frequent use of them to conceal the evil flavor of decaying meat. To combat this practice it is urged that butchers be prohibited to spice the meat they sell and that the price of condiments be raised so high by law that their abundant use in private homes will be made impossible. Warm drinks, tea and coffee especially, are considered and are accorded scant approval. An interesting discussion of boiled water is given in which Frank points out that while certain illnesses are benefited by its use, so many healthy components of the water are destroyed in the process that it should only be employed when definitely indicated as a medicament. Beer, wine and spirits are dealt with at great length, how they should be made, stored and used. As a physician Frank says that he cannot look upon the use of any of them as an aid to health though a moderate amount of drinking is probably not actively harmful. Against excessive drinking he feels that the police should launch a most powerful attack. The chapter on moderation in general and on moderation in eating and drinking in particular quotes very revealing laws which had been recently passed in France and Germany to curb over-indulgence in both these pleasures. As an affirmative answer to the question whether immoderation in eating and drinking can be stopped by the passage of laws Frank cites the success which followed Mohammedan and Jewish legislation in these regards and the custom of total abstinence among Roman women and Carthaginian candidates for state office.

SANITATION

The problems of sanitation are dealt with under the headings of habitation, disposal of refuse, and water supply (III, ii and iv). Very wise dicta are issued concerning the necessity of using good materials in building dwellings and following plans which provide for healthy exposure, light and ventilation. The need of choosing a high, dry location and avoiding the neighborhood of stagnant streams is stressed and Frank then bewails the fact that cities which have been wise enough to drain natural swamps allow their streets to be converted into artificial ones by the dumping of water into muddy streets and the heaping of garbage and sewage in back yards and before house doors. He maintains that there is no more vital duty of municipal authorities than the establishment of common dumping grounds at a good distance from the city limits where prevailing winds will not blow evil odors and disease breeding vapors back upon the town. He advises the establishment of a city service to remove sewage and garbage to these refuse heaps because it is too important a factor in common welfare to be entrusted to individual householders. The cleaning and draining of street gutters he believes should also be dealt with by servants of the municipality. The accomplishments of imperial Rome in the field of sanitation are, of course, the ideals which he would hold always before the minds of the authorities, and constant reference is made to the details of the Roman system. The question of what forms of water are potable; snow water, rain water, rivers, streams, wells and springs is carefully considered. The necessity of having privies and garbage dumps so located that they cannot contaminate drinking water is brought out in no uncertain terms and the duty of the city authorities to test and certify all water before it may be used for human or animal consumption is stressed.

Certain of the problems for whose solution Frank makes provision in his system are dealt with today by agencies other than the department of public health. Questions of forensic medicine have been quite exclusively placed in the hands of the medical practitioner (at least in the United States) and medical education has been entrusted to the universities. However, so much attention is paid to these matters in the "Medicinische Polizey" that at least brief mention must be made of them here.

Most of Volume IV is devoted to questions of accidents occurring in a multitude of ways and Frank considers it the duty of the public health organization to take steps toward the prevention of such occurrences, or if they do come about, to deal with the individuals or organizations responsible for them. The Hand of God being the only discoverable agent in such cases as accidents during earthquake, volcanic eruptions and floods, the authorities can only pass regulations requiring citizens to seek due safety during such events. But in industrial accidents, accidents occurring on public roads, duels, murders, suicides, and other affairs in which there is a human element, preventive measures can and must be enforced.

The biographical sketch has already given an outline of Frank's outstanding work in the reorganization of medical education and midwifery, and reference has been made to his proposals for the improvement of pediatric practice. In the three parts comprising Volume VI of the "Medicinische Polizey" he gives a complete statement of the underlying beliefs which motivated his practical steps in reform of medical education and supervision of medical practice. That which medicine can and should do for humanity has had no more feeling and eloquent expression than Frank gives it. And a high standard even for modern universities is set by this statement of his conception of the ideals for which medical education should strive together with suggestions regarding practical measures to be instituted to attain these ideals (Supp. Vol. I and II).

Other considerations with which Frank deals at great length cannot be included in the categories of modern public health organization because they represent problems for which there is no modern equivalent. Among these, that to which Frank devotes all of Volume v is the question of apparent but not real death and the danger that persons in such a state shall be buried alive. It seems a bit incongruous that a medical man should have felt the necessity of going into a problem which Frank himself says was puzzling only to the laity. But when one remembers that in the eighteenth century there were vast rural districts in which physicians were scarce and that in these areas the duty of pronouncing persons dead fell upon the shoulders of untrained laymen, one can understand Frank's feeling that municipal decrees must regulate carefully the criteria which should be used in making such pronouncements. There is given a thorough discussion of the pathological states in which such apparent death occurs: coma, shock, catalepsy. This is followed by directions as to the means to be employed in rousing patients from these states and finally a long list of tests to be used in differentiating these conditions from actual death.

Difficult as it is to make a critical study of as vast a work as the "Medicinische Polizey" it is yet more difficult to write an appreciation of it. Although the "System" is judged to be the first modern comprehensive attempt to codify the details of public health administration little attempt has been made to trace what influence it may have had on the subsequent history of public health. To judge whether Frank was more than a curiosity, a man whose ideals were thoroughly modern but who had little influence, is a major problem in itself. The analyses of his ideas given in this paper can make possible such an evaluation.

To elaborate praises of Frank's penetrating thought, his vision, and his scholarly treatment of his subject would be useless. If these things do not speak for themselves no one can speak for them. To assume a condescending air and smile at his faith in the power of legislation, his inclusion of much superstition and prejudice with the more enduring matter of his discussion, would be equally useless. Kratter[12] in 1888 made an observation which will perhaps serve better as epilogue than anything else which could be said:

> If anyone has leisure and desire to refresh himself with a language which has not yet buried thought beneath a professional idiom but still conveys it without embarrassment or reservation, and if anyone enjoys a frank delineation of social conditions—let him read Frank.

APPENDIX

The following bibliographical description of the six volumes of "System einer vollständigen medicinischen Polizey" with the three supplementary volumes is made in each instance from the first editions, and this original text has also been used exclusively for the analyses and translations in the preceding paper. Volumes I to v are from the Yale University Library; Volume VI and the first and second supplementary volumes are from the Library of the New York Academy of Medicine; and third supplementary volume from the John Crerar Library of Chicago, Illinois. Later editions of most of the volumes, and Italian and Dutch translations, appeared before Frank died.

The contents of each volume have been given in some detail in order to guide the reader, for repeated references throughout the text have seemed cumbersome. More or less literal translations of the headings of the various sections have been retained in order to illustrate the picturesque language which characterizes all of Frank's writing in the "Medicinischen Polizey." The references to these volumes throughout the text have been given as "(II, p. 164)," indicating volume II, page 164; "(III, iii, 2)," indicating volume III, division iii, section 2; and "(I, iv)," indicating volume I, division iv.

Numerous footnotes with specific quotations and references and descriptive marginal notes characterize all except the supplementary volumes. The title vignette (see Fig. 2) is found in Volumes I to IV. The inscription on it reads, "Servandis et augendis civibus."

Under "collation" and "contents" the numbered pages are indicated; unnumbered leaves are referred to by signatures. It is to be noted that in accordance with the usage of the sixteenth and seventeenth century printers the signatures, J, V and W, are always omitted. The size of the type-page of Volumes I to IV inclusive measures approximately 75 × 150 mm. and that of Volume V, 72 × 135 mm.

Volume I. 1779.

Title Page: Johann Peter Frank, M.D. / Hochfürstlich Speyerischen Geheimenraths/ und Leibarztes, / System/ einer vollständigen/ medicinischen Polizey./ [rule] / Erster Band./ Von Fortpflanzung der Menschen und Ehe-Anstalten, / von Erhaltung und Pflege schwangerer Mütter, / ihrer Leibesfrucht und der Kind-Betterinnen / in jedem Gemeinwesen. / [title vignette] / Mannheim, / bei C. F. Schwan, kuhrfürstl. Hocbuchhändler, / 1779.

Collation: 8° : A-Z^8, Aa-Uu^8, Xx^4 : xvi + 678 pp., 1 l.

Contents: A1*a* is title page; A2*a*–A8*b*, preface; B1, table of contents; pp. 3–678, text; Xx^4, errata. [p. iv is wrongly numbered vi; and 524 numbered 424.]

Notes: The preface sets forth the general ideas and principles underlying the *medicinische Polizey* and is signed "Geschrieben zu Bruchsal im Bisthum Speyer, 1778." There is an introduction, dealing with the necessity of the *medicinische Polizey*, population problems in general, and the contemporary health conditions among civilized peoples. The subject matter is then further divided into the following divisions and sections:

Division i (pp. 3–296).
  Section 1. Procreative instinct in general and its relation to the health of the community.
  Section 2. Celibacy of clergy.
  Section 3. Celibacy among the laity.
  Section 4. Celibacy of warriors.
Division ii (pp. 297–568).
  Section 1. Too early marriage.
  Section 2. Too late and unequal marriage.
  Section 3. Unhealthy marriage.
  Section 4. Marital fertility and physical handicaps to it.
  Section 5. Harm to population from restrictions of freedom in marriage choice.
  Section 6. Training of daughters as future mothers of the community.
  Section 7. Necessity of instructing those about to be married in the duties of the marital state.
Division iii (pp. 569–678).
  Section 1. Pregnancy in general, its rights and privileges in the life of the community. The necessary care of pregnant women and their offspring.
  Section 2. Cesarian sections on women dying undelivered and the saving of their offspring.
  Section 3. Necessary care for parturient and puerperal women in each community.

Volume II. 1780.

Title Page: Johann Peter Frank, M.D. / Hochfürstlich Speyerischen Geheimenraths / und Leibarztes, / System / einer vollständigen / medicinischen Polizey. / [rule] / Zweiter Band. / Von der aussereheligen Zeugung, dem geflissentlichen Miss- / gebähren und andern Misshandlungen der uneheligen / Kinder, von der physischen Erziehung des Neuge- / bohrnen bis zum erwachsenen Bürger. / [title vignette] / Mannheim, / bei C. F. Schwan, kuhrfürstl. Hofbuchhändler, / 1780.

Collation: 8° : A-Z^8, Aa-Xx^8 : viii + 692 pp., 1 l: 1 fig.

Contents: A1*a* is title page; A2*a*-A4*b*, preface; A5, table of contents; A6*a*, title page for the 1st division; pp. 3–692, text; unnumbered pages on Xx8, errata. The figure is on an unsigned leaf between O5 and O6, facing p. 209, and is numbered 209. E4 is incorrectly signed E3.

Notes: The preface is dated Bruchsal, 20th March, 1780 and contains a summary of the contents of the volume with repeated appeals for support of his proposed *Medicinische Polizey*. The contents of the volume are divided as follows:

- Division i (pp. 1–160). General considerations regarding the general care of unmarried mothers and their offspring.
  - Section 1. Illegitimacy in general.
  - Section 2. Criminal abortion; abandoning and murdering of illegitimate children.
- Division ii (pp. 161–514). Various considerations influencing the life, rearing, and bodily condition of children up to their seventh year which are worthy of police inspection.
  - Section 1. Protection of young children from accidents and from mistakes common to the usual methods of training which form obstacles to healthy development.
  - Section 2. The duty of mothers to nurse their children and its influence upon the welfare of the state.
  - Section 3. Organization of wet nurses and early care of motherless children.
  - Section 4. Orphan asylums and homes for foundlings.
- Division iii (pp. 515–692). Care of health of school children and the necessary police supervision of educational institutions.
  - Section 1. Disadvantages of too early forcing of youthful minds and bodies.
  - Section 2. Schools and education of the young in their relation to the welfare of children and the state.
  - Section 3. Restoration of gymnastics and the advantage of such in public education.

VOLUME III. 1783.

Title Page: Johann Peter Frank, M.D. / Hochfürstlich Speyerischen Geheimenraths / und Leibarz- / tes, der Kuhrmainzischen Akademie der Wissen- / schaften Mitgliedes, / System / einer vollständigen / medicinischen Polizey. / [rule]/ Dritter Band. / Von Spiese, Trank und Gefässen. Von Mässigkeits- / gesetzen, ungesunder Kleidertracht, Volksergözlichkeiten. / Von bester Anlage, Bauart und nöthigen Reinlichkeit / menschlicher Wohnungen. / [title vignette] / Mannheim, / Bei C. F. Schwan, kuhrfürstl. Hofbuchhändler, / 1783.

Collation: 8° : A-Z^8, Aa-Zz^8, Aaa-Sss^8 : xiii + 1004 pp., 2 l.

Contents: A1*a* is title page; A2*a*-A7*a*, preface; A8, table of contents; B1*a*, title page for 1st division; pp. 3–1004 text; Sss7 and 8, advertisements for other books printed by Schwan. [There are the following errors in pagination: 872–3 for 870–1, 876–877 for 874–5, 880 for 878, 893 for 892.]

Notes: The preface is dated "Bruchsal, auf Johannstag, 1782." It describes the contents of the volume and justifies the choice of subject material. The volume has the following divisions:

- Division i (pp. 1–348). Healthful care of food.
  - Section 1. Care of meat.
  - Section 2. Care of other animal products.
  - Section 3. Care of fish.
  - Section 4. Care of vegetables.
  - Section 5. Various condiments.
- Division ii (pp. 349–649). Care of drinks.

- Section 1. Care of drinking water and wells.
- Section 2. Care of beer.
- Section 3. Care of wine from grapes and other fruits.
- Section 4. Care of spirits.
- Section 5. Harmful vessels and utensils.

Division iii (pp. 650–816). Moderation in general.

- Section 1. Lack of moderation in eating and drinking.
- Section 2. Healthy wearing apparel.
- Section 3. Popular amusements.

Division iv (pp. 817–1004). Human dwellings in general.

- Section 1. The best locations for human dwellings.
- Section 2. Healthy kinds of buildings for human dwellings.
- Section 3. Public sanitary arrangements in cities and in lodgings.

VOLUME IV. 1788.

Title Page: Johann Peter Frank, M.D. / K. K. wirkl. Gubernialraths zu Mayland, Direktors der / medicin. Fakultät und sämtlicher Spitäler der österrei- / chischen Lombardey, Professors der praktischen Arzeney- / schule zu Pavia, und Mitgliedes verschiedener / Akademien der Wissenschaften, / System / einer vollständigen / medicinischen Polizey. / [rule] / Vierter Band. / Von Sicherheits-Anstalten, in so weit sie das Gesund- / heitswesen angehen. / [title vignette] / Mannheim, / in der kurfürstl. Hofbuchhandlung bei C. F. Schwan / und G. C. Götz, 1788.

Collation: 8° : a^8, b^7, A-Z^8, Aa-Zz^8, Aaa^8: 15 ll., 749 pp., 1 l., 2 tables.

Contents: a1*a* is title page; a2*a*-a4*b*, preface; a5, table of contents; a6*a*, title page of first division; a7*a*-b7*b*, introduction; Al*a*, another title page to first division; pp. 3–749, text; Aaa7*b*, postscript; Aaa8, advertisements. The tables are on b3 (folding table) and b2.

Notes: In a six-page preface he expresses gratitude for the favorable reception of the previous volumes and explains the long delay between the third and fourth volumes. He acknowledges the benefit he has received from his practical experiences in the Austrian Lombardy and excuses the inclusion of much extraneous material in this volume on the basis that future generations must sift out what they need. The preface is dated Pavia, 1st of August, 1788. The contents of the volume are divided into:

Introduction (a7*a*-b7*b*). Public safety in general.

Division i (pp. 1–392). Accidental and thoughtless breaches of public safety.

- Section 1. Accidents from earthquakes, falls, turning over, crushing, running over, etc.
- Section 2. Accidents from water and fire.
- Section 3. Accidents occasioned by dangerous games, somnambulism, insane people, etc.
- Section 4. Accidents from horrible natural phenomena.
- Section 5. Accidents occasioned by wandering harmful beasts.
- Section 6. Accidents from mad and biting dogs.

Division ii (pp. 392–749). Intentional breaches of public safety.

- Section 1. Accidents from administration of poison.
- Section 2. Accidents from fighting, assassination, duels, suicide, etc.
- Section 3. Accidents from superstitions concerning magic, black magic, and magic cures.
- Section 4. Ill-usage of dying persons.
- Section 5. Danger of burial alive and delayed burial.

A postcript, dated the 29th of August, 1788 and signed J. P. Frank, acknowledges the receipt of a German work on *medicinische Polizey* which he would have used had it reached him earlier. He begs that friends who wish to send him their works communicate directly with his publisher in Mannheim in order to expedite the delivery of such contributions. Two pages of descriptions of books published by Schwan follow. Among these appears the interesting note following the title of Frank's "System einer vollständigen medicinischen Polizey": "1. 2. 3. Band mit dem portrait des Verfassers." There is no evidence of such a portrait in any of the several volumes we have seen.

VOLUME V. 1813.

Title Page: Johann Peter Frank's / M.D. Kaiserlich-Russischen wirklichen Staatsrathes und Leibarztes, / Mitgliedes verschiedener Akademien der Wissenschaften, / System / einer vollständigen / medizinischen Polizey. / [rule]/ Fünfter Band. / Von Sicherheits-Anstalten, in so weit sie das Gesund- / heitswesen angehen, und von Beerdigung der / Todten. / [double rule] / Tübingen, / in der J. F. Cotta'schen Buchhandlung. / 1813.

Collation: 8°: [*]^5 A-Z^8, Aa-Ff^8; Gg^4: 1 l., viii + 469 pp., 1 l.

Contents: Of the five unsigned leaves at the beginning of the book, one is a portrait of the author bound on a stub around pp. i–viii facing the title page on p. i and pp. iii–viii are preface. A1*a* is a title page for the second division; pp. 3–469, text; Gg3*b*, blank; Gg4*a*, table of contents. [There are the following errors in pagination; 529 for 429, 566 for 466, 467 for 567.]

Notes: The preface is signed "Wien in Oesterreich, den 19. Marz 1812." The volume is a continuation of Division ii of Volume IV.

Section 6. Apparent death and the necessary precautions against it, in general.

Section 7. Apparent death caused by lack of suitable air.

Section 8. Apparent death caused by prevention of respiration.

Section 9. Apparent death caused by depressed or exhausted vitality.

Section 10. Burial institutions, funeral ceremonies, cemeteries.

Doll[7] p. 79, indicated that there might have been an 1811 edition (Freyburg) but we have been unable to find any evidence of such a volume.

VOLUME VI. 1817–1819.

This volume appeared in three parts. In the copy in the library of the New York Academy of Medicine these are bound in two volumes. Part I comprises the first volume and Parts II and III, the second.

NEW YORK ACADEMY FIRST VOLUME (Part I of Volume VI).

Title Page: Johann Peter Frank's / Med. Dr. Kaiserlich. Russischen wirklichen Staats-/ rathes und Leibarztes, Mitgliedes verschiedener Aka-/ demien der Wissenschaften, / System / einer vollständigen/ medicinischen Polizey. / [rule] / Sechster Band / I Theil / von der Heilkunst und den medicinischen Lehr-/ anstalten in Allgemeinen. / [rule] / Wien, / bey Carl Schaumburg und Comp. / 1817.

Collation: 8 : [*] ^{1} ,[1] -2^8, A -Z^8, Aa-Oo^8: 1 l. xxx pp. 1 l., 589 pp.

Contents: [*] 1b is a portrait of Frank; [1] 1a is a title page for Part I of Volume VI; [1] 1b has a Latin quotation; [1] 2a is a second title page for the same part; [1] 2b has the same quotation as [1] 1b; [1] 3a to 2-7b are preface; 2-8a is table of contents; A 1 -Oo7b are text; Oo8a, errata. The second title page is exactly the same as the first, excepting that for "System einer vollständigen medicinische Polizey" is substituted "Medicinalwesen" and the words "sechster Band" are omitted. The second title page in each part of Volume VI presents these same differences. All of section 1 (252 pp.) is quoted by Schmidtze.[22] Marginal notes appear only at the beginning of the broad divisions of Section 1, but are frequent in Section 2.

Notes: The preface, dated Vienna, March 19, 1816, contains recognition of contemporary works on various limited fields of public health (with specific references) and of works by Frank's predecessors on allied subjects (with specific references). There is a defense of the title "medicinische Polizy" for his proposed system, in contrast to other terms preferred by his critics. A rebuttal of various objections raised against his various volumes, especially those by Stoll, is submitted. The volume is divided into the following sections:

Division i.

Section 1. The healing art in general and its influence upon the welfare of the state.
Section 2. Medical schools in general.

NEW YORK ACADEMY SECOND VOLUME (Part II of Volume VI).

Title Page: Johann Peter Frank's / Med. Dr. Kaiserlich-Russischen wirklichen Staats- / rathes und Leibarztes, Mitgliedes verschiedener Aka- / demien der Wissenschaften, / System / einer vollständigen / medicinischen Polizey. / [rule] / Sechster Band / II Theil / Von medicinischen Lehranstalen ins Besondere. / [rule] / Wien, / bey Carl Schaumburg und Comp. / 1817.

Collation: 8°: [*]^4, A-Z^8, Aa-Ss^8, Tt^4, Uu^4, chart unsigned: 4 1., 671 pp., 1 chart.

Contents: Of the four unsigned, unnumbered leaves, [*] 1*a* is a title page for Part II; [*] 1*b*, a quotation; [*] 2*a*, a second title page; [*] 3*a*, table of contents; [*] 4*a*, errata: pp. 1–671, text; 1 1. with chart.

Notes: The volume is divided into the following sections:

Division ii.

Section 1. Public instruction in the healing art in particular.
Section 2. Human anatomy and general physiology.
Section 3. Special human physiology and pathology.
Section 4. General therapy and pharmacology.
Section 5. Special pathology and therapy.
Section 6. Surgery.
Section 7. Practitioners of minor medical arts.
Section 8. Obstetrics.

NEW YORK ACADEMY SECOND VOLUME (Part III of Volume VI).

Title Page: Johann Peter Frank's / Med. Dr. Kaiserlich-Russischen wirklichen Staatesrathes / und Leibarztes, Mitgliedes verschiedener Akademien / der Wissenschaften und Ritters des St. Constantin- / Georgen-Ordens, / System / einer vollständigen / medicinischen Polizey. / [rule] / Sechster Band / III Theil / von der Vieharzneykunde; von der Prüfung / und Bestätigung der Heilkünstler. / [rule] / Wien. / bey Carl Schaumburg und Comp. / 1819.

Collation: 8 : [*]^3, A-T^8, U^4 : 3 1., 309 pp., 1 1.

Contents: Of the three unsigned, unnumbered leaves, [*] 1*a* is a title page for Part III; [*] 1*b* bears the imprint, "Wein, gedruckt bei J. G. Akkermann"; [*] 2*a* is the second title page for Part III; [*] 3*a*, table of contents; pp. 1–309, text; U4*a* and *b*, advertisements.

Notes: There is no preface in the copy used. The contents follow those of Volume VI, Part II directly and are divided into:

Division ii.

Section 9. Veterinary art.
Section 10. Examination and certification of physicians.

SUPPLEMENTARY VOLUME I. 1812.

Title Page: Johann Peter Frank's / Sr. Kaiserlichen Majestät von Russland wirklichen / Staatsrathes und Leibarztes, / Supplement-Bände/ zur / medicinischen Polizey, / oder / Sammlung / verschiedener, in diese Wissenschaft einschla- / gender, eigener Aufsätze ./ Erster Band. / [rule] / Tübingen, / in der J. G. Cotta'-schen Buchhandlung. / 1812.

Collation: 8° :[*]^1, *§ , 1–16^8, 17^6 : 1 1., xvi + 267 pp.

Contents: [*] 1*a* is the title page;, *1*a*-*8*b*, preface; pp. 1–267, text.

Notes: The preface is dated "Freyburg in Breisgau, den Marz, 1811." The volume is filled with scattered suggestions and descriptions of:

1. Hospitals and public institutions in the Austrian Lombardy.
2. Ordinances for the apothecaries.
3. Plans for the faculty and for medical education in the schools of Pavia.

SUPPLEMENTARY VOLUME II. 1825.

Title Page: Johann Peter Frank's / Wieland Med. Dr., Kaiserl. Russischen wirklichen Staats-/ rathes und Leibarztes, Mitgliedes verschiedener Akade / mien der Wissenschaften und Ritters des St. Con- / stantin-Georgen-Ordens, / Supplement-Bände / zur/ medicinischen Polizey / oder / Sammlung / verschiedener, in diese Wissenschaft einschla- /gender, eigener Aufsätze/[rule]/ Zweiter Band. / Nach den hinterlassenen Papieren des verewigten Herrn / Verfassers heraus gegeben / vom / Dr. Georg Christian Gotthilf Voigt, Physikus bei einem Königl. Sächsischen Consistorio, verpflichtetem / Arzte bei einen Wohllobl. Almsenamte, und ausübenden / Arzte zu Leipzig. / [rule] / Leipzig / in der Kuhn'schen Buchhandlung. / 1825.

Collation: 8°:[*]^1, *^{8}, 1–21^8, 22^3: xviii + 341 pp., 3 folded charts.

Contents: The unsigned leaf,* 1 is numbered pp. i and ii: pp. i, title page, iii– x, preface, xi–xviii, table of contents, 1–341, text, 22-3*b*, errata. (pp. i–iii and p. 1 unnumbered.)

Notes: The preface, signed by Voigt, "Ostermesse, 1829, Leipzig," gives the details of publication of these notes following Frank's death by Voigt. The volume itself is filled with notes and quotations on medical education, military medicine, vital statistics, venereal disease and public safety.

SUPPLEMENTARY VOLUME III. 1827.

Title Page: Johann Peter Frank's/ Wieland Med. Dr., Kaiserl. Russischen wirklichen Staats-/ rathes und Leibarztes, Mitgliedes verschiedener Akade / mien der Wissenschaften und Ritters des St. Con- / stantin-Georgen-Ordens, / Supplement-Bände / zur / medicinischen Polizei, / oder / Sammlung / verschiedener, in diese Wissenschaft Einschla- / gender, eigener Aufsätze./ [rule] / Dritter und letzter Band. / Nach den hinterlassenen Papieren des verewigten Herrn / Verfassers heraus-gegeben und mit drei vollständigen / Registern Versehen / von / Dr. Georg. Christian Gotthilf Voigt,/ Physikus bei einem Königl. Sächsischen Consistorio, verpflichtetem / Arzte bei einem Wohllöbl. Almosenamte, und aussübendem / Artze in Leipzig. /. [rule] / Leipzig, / in der Kühns'chen Buchhandlung./ 1827.

Collation: 8° : [*]^6, 1–50^8, 51^2 : xii + 803 pp., 7 tables.

Contents: p. i is a blank; p. ii*a*, title page; pp. iii–xii, preface; pp. 1–803, text. [34* is incorrectly signed 43*]. Table I is on an unsigned leaf between 12-8 and 13-1; Tables II and III on unsigned pages between 13-2 and 13-3; Table IV between 13-3 and 13-4; Table V between 15-5 and 15-6, Table VI on p. 284, 18-6*b*; and Table VII on an unsigned leaf between 18-6 and 18-7. The second leaf of each octavio is always signed with a *.

Notes: The preface signed by Voigt is undated. He states in it that this is the last of the Frankian notes left to him, and that it has been delayed so long because of the tremendous work involved in compiling the indices. The table of contents is very long and detailed but is divided into the following major divisions:

I. Hospitals (pp. 1–350).
II. Epidemics and Infectious Diseases (pp. 351–543).
III. Register (pp. 545–803).

These 258 pages of Index for all of the volumes of the "Medicinische Polizey" are divided into three sections: (1) a subject index, (2) an author index, and (3) an index for various ordinances, scientific tracts, etc., to which no author's name could be attached. There are well over 3000 references in the last two sections.

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[From Erastus: Varia Opuscula Medica. Francofurdi, 1590.]

EDITORIAL

DR. JOHN MITCHELL'S ACCOUNT OF THE YELLOW FEVER IN VIRGINIA IN 1741–42, WRITTEN IN 1748

A MANUSCRIPT of prime importance in the history of American medicine has recently been presented to the Library of the College of Physicians of Philadelphia. It is entitled "An Account of the Yellow Fever in Virginia in 1741–42, Written in 1748," by Dr. John Mitchell. Its author, Dr. John Mitchell, was an English physician who had come to America about 1700, and lived at Urbanna on the Rappahannock River. The date of his birth and where he received his medical education are unknown. He was an ardent botanist and Linnaeus, with whom he corresponded, named the partridge vine or squawberry *Mitchellia repens* in his honor. He was the author of two botanical treatises: "Dissertatio Brevis de Principiis Botanicorum et Zoologicorum," 1738, and "Nova Plantarum Genera," 1741. In 1755 he published a map of the British and French possessions in America which is considered a most valuable contribution to North American geography. Dr. Mitchell returned to England in 1746. He was elected a Fellow of the Royal Society, to whose Proceedings he was a frequent contributor. He also published several articles on the political relations between Great Britain and her American colonies. Dr. Mitchell died in 1768.

The significance and importance of the manuscript lie in the fact that it was its perusal which prompted Dr. Rush to try his famous treatment of yellow fever by copious bleeding and purgation, a treatment by which he claimed he obtained better results than any of his colleagues, and the bitter controversy which arose from this and from Rush's assertion of his belief that the disease was of domestic origin, instead of imported on ships from the West Indies, in contradiction of the published opinion of the College of Physicians of Philadelphia, that it was of foreign origin, led to Rush's resignation from the College and to a copious warfare carried on by letters published in the newspapers.

In Rush's "An Account of the Bilious Remitting Yellow Fever as it appeared in the City of Philadelphia in the year 1793," which he published in 1794, he tells how the manuscript of Dr. Mitchell fell in his hands and the use he made of it. At the outset of the epidemic in 1793 he had pursued various lines of treatment without success; finally he says:

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> I recollected that I had among some old papers, a manuscript account of the yellow fever as it prevailed in Virginia in the year 1741, which had been put into my hand by Dr. Franklin, a short time before his death. I had read it formerly, and made extracts from it into my lectures upon that disorder. I paused upon every sentence; even words in some places arrested and fixed my attention.

He was particularly struck with Dr. Mitchell's recommendations of frequent purgation and bleeding to depletion, and this led him to try his famous treatment with his "10 and 10," ten grains of calomel and ten grains of jalap, every six hours, followed after purgation had occurred, if the pulse was full and tense, by bleeding 8 or 10 ounces of blood.

Through the kindness of Mr. John Cadwalader and the other members of his family our College has now received this most valuable addition to our collection of manuscripts, valuable because of its authorship, its association with Benjamin Franklin and as a source of inspiration to Benjamin Rush.

The letter of Dr. Mitchell has been published twice: (1) in the *Medical Museum*, vol. 1, no. 1, 1804; (2) in the *American Medical and Philosophical Register*, vol. 4, 1814, with a note by the Editors stating that it had been sent to them by Dr. Rush.

In 1909 Dr. S. Weir Mitchell presented to the College of Physicians a sort of copybook which had belonged to Dr. John Redman Coxe. It contained a number of manuscript notes concerning yellow fever and amongst other things a transcription of this letter of Dr. John Mitchell's. The book was compiled by Dr. Coxe in 1794.

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BOOK REVIEWS

THE SCIENCE OF RADIOLOGY. Edited by Otto Glaser, M.D. Springfield, Ill., Charles C. Thomas, 1933.

This composite work on the history of the development of the science of radiology contains twenty-five sections covering their respective subjects with great thoroughness, written by twenty-six of the leading American authorities on radiology. Every aspect of the subject is dealt with from the account of the discovery of the roentgen rays by Roentgen in 1895 to the most recent advances in our knowledge of the newer rays and radium. The book is the outcome of the First National Congress of Radiology held in connection with the Century of Progress exhibition in Chicago this year. Before the Congress met a Committee on History and Education was appointed by the Executive Committee, charged with the duty of preparing for the Congress a book which would describe the outstanding developments in the science of radiology during the thirty-eight years in which it has existed. The chairman of this Committee was Dr. Byron Hubbard Jackson. The task of editing the work was placed in the able hands of Dr. Otto Glaser and he has fulfilled his difficult duty with great skill. The first sections are devoted to the history of the discoveries of Roentgen and Pierre and Marie Curie, and the remaining ones deal with the history of the subsequent developments of the science of radiology. The physics of radiology, the apparatus used in the application of the *x*-rays and radium, dosimetry, protection from burns, industrial radiology, in fact every aspect of the science are fully dealt with by well-known authorities. The concluding chapters are summaries of our knowledge of the cosmic rays by Arthur R. Compton, and of the so-called Gurwitsch rays by William Seifriz. The latter, the "vital rays" given off by living cells, supposed by Gurwitsch, their discoverer, to be comparable if not identical with ultraviolet rays, were discovered about ten years ago and are at the present time occupying a disputable field of the greatest interest both to physicists and biologists. This book is not only a valuable history of radiology but an authoritative presentation of the present status of the science. It is adequately illustrated and contains an excellent index of names and another of subjects.

MONT BLANC SIDESHOW. THE LIFE AND TIMES OF ALBERT SMITH. By J. Monroe Thorington. Phila., John C. Winston Co., 1934.

The name of Albert Smith, though met with frequently in the memoirs and letters of his more eminent literary contemporaries, has but little significance at the present day. His novels are forgotten, few have heard of his wonderful shows, and that he was a member of the medical profession is unknown to most. In his recently published book "The Physician as a Man of Letters, Science and Action," Dr. Thomas K. Monro devotes a few lines to him, but he is not mentioned by Sir Humphry Rolleston in his Lloyd Roberts Lecture (1933) on "The Associations between Medicine and Literature." This is probably because he did practically nothing in medicine and his other achievements were of a most ephemeral character. Nevertheless the record of his life is worthy of preservation and Dr. Thorington has presented it most delightfully.

Albert Smith was the son of a medical practitioner at Chertsey. He studied medicine at the Middlesex Hospital in London during the 1830's, under Mr. Arnott, and was then apprenticed to an apothecary named Whittle. Smith became a Licentiate of the Society of Apothecaries, and in 1838 a member of the Royal College of Surgeons. His father then sent him to Paris for postgraduate work, after which he returned to Chertsey and assisted his father. While in France, Smith had made an excursion to the Alps and on his return to England he made a number of large scale pictures from sketches he had drawn, and placing them on a roller with a suitable lighting arrangement he gave a number of lectures before literary and scientific institutions. He also wrote a number of contributions to various periodicals. In 1841 he settled in London and definitely embarked on his literary career. He contributed extensively to the recently founded *Punch*, and wrote quite a number of dramatic pieces, and several novels. By his descriptions of the life of the medical student in London Smith did much to produce the popular conception of that character in the first half of the nineteenth century as a rough, coarse, boisterous drunkard. After travelling in the East he gave in London a series of illustrated lectures which he called the "Overland Mail." In 1851 he made an ascent of Mont Blanc and then produced a sort of lecture recital with dioramic pictures of his ascent, accompanied by some occasional songs and stories and skits on Continental life and travellers. This was so successful that he continued it before crowded houses until 1858, when after a journey to China he produced a new diorama entitled China, which proved equally successful. Smith was very witty and could tell a good story and compose a taking song with great facility. He mingled with all the best known literary and artistic lights of the day in London, and was a general favorite. Dr. Thorington was especially drawn to him, as the title of this book implies, by his exploits as an alpinist but the Author has done well in recalling to mind a very vivid character, and his well-written narrative will be read with pleasure by all who are interested in the London world of that day. He has brought forward much about the theatrical and bohemian life of Victorian London, and the various haunts, such as the Cider Cellars, so loved by Thackeray. A number of well-chosen illustrations, a most complete bibliography and a good index add greatly to the pleasure and value of the book.

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